

# THE IRON AGE -- December 29, 1932

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G. H. GRIFFITHS, *Secretary*

C. S. BAUR, *General Advertising Manager*

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# THE IRON AGE

DECEMBER 29, 1932

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## Restyling—a Major Factor in Future Merchandising Programs

An Interview With Gordon Armstrong,  
Assistant to the President, Youngstown  
Pressed Steel Co., Warren, Ohio



GORDON ARMSTRONG

THE time-worn formula of cutting production costs, lowering prices and waiting for an automatic expansion of buying can no longer be depended upon. In many cases the possibilities of reducing costs to widen markets have been exhausted. Certain it is that in the manufacture of consumer goods production costs are no longer the controlling factor. That is why distribution in all its ramifications is commanding the major attention of industrial executives at the present time.

And it is no passing fad. Distribution will be our main industrial problem for the rest of our lives, in the opinion of Gordon Armstrong, assistant to the president, Youngstown Pressed Steel Co., Warren, Ohio, who for the past two years has been concentrating on certain phases of merchandising in the metal-working industry. "The outstanding successes of the future," he declared in discussing the subject with a member of THE IRON AGE staff, "are going to be achieved through a close study of the consumer—of what he wants and what he needs, and how to get it to him cheaply."

The problem of distributing consumer goods is by no means of mere academic interest to readers of THE IRON AGE. It is well known that as consumer goods go, so go capital goods. Our entire industrial volume is finally measured by the purchases of the ultimate consumer. Moreover, the principles that are successfully applied in the selling of consumer goods will inevitably influence the merchandising of semi-consumer or utilitarian products and, finally, producer goods themselves.

"Industry has barely started in its study of distribution," said Mr. Armstrong. "Although the war developed enough mechanical ingenuity and experience to permit mass production of almost any product at rock bottom costs, we are just beginning to learn something about the different phases of the distribution cycle and the necessary steps to take during each of them."

### The "Pioneering" Period in Distribution

"We are just commencing to realize that certain definite stages are passed through by every product. The first can be termed the 'pioneering' period.

Then it is a case of selling a new idea to the consumer. It's a clock with a bell to waken you in the morning. It's individual transportation without horses—an automobile. It's a safe razor to shave you. It's a machine to bring in sound—a radio. It's a machine to wash clothing.

"In other words, the problem is one of selling something which by mechanical means satisfies a want which had previously been provided by nature, by hard work, or not at all. The product may contribute to comfort, leisure or profits, or may merely satisfy vanity, but directly or indirectly it strikes three motivating influences: health, happiness and wealth.

"In this pioneering period the manufacturer is reaching a thin market. Probably at first the alarm clock found use only among city people. The farmer still used the sun—got up at daybreak and went to bed at nightfall. Possibly there weren't many alarm clocks sold for a time.

### The Mass Production Stage

"When finally the manufacture of such clocks became profitable, competition sprang up and eventually the product became not merely an alarm



clock, but a clock with a name for identification. Then advertising was used to popularize the name. In due course mass production developed and many names came into the picture. As a consequence the clock became something more than a product with a name—it became a product that would perform a specific function and sell at a particular price.

"In this manner the pioneer alarm clock finally evolved into a Big Ben or an electric clock, the pioneer automobile evolved into a Ford or a Rolls-Royce, the early radio into an Atwater-Kent or a Stromberg-Carlson.

"No product ever stands still," declared Mr. Armstrong. "The positions of various competitors in a given field are constantly changing—one forges ahead and others drop back. Frequently the infant manufacturer of yesterday is the leader of today. Yesterday's household trade name may be a back number so far as the buyer of today is concerned. The whole production and distribution system of the world—and particularly that of this country—is in a constant state of flux.

"Continued market uncertainty causes an intensification of competition as the number of manufacturers in a given field increases. Usually the method pursued to capture a maximum share of a market has been to cut costs and reduce prices. The available market might be likened to a pyramid the peak of which is one buyer. If the price is reduced 10 per cent the top of the pyramid is sliced off and the product is brought within the reach of say 100 or 1000 buyers. This process can be continued until the base is reached—a condition which is perhaps typified by the sale of the safety razor today. Nowadays one can buy a package of razor blades and get a safety razor to boot. Thus a product is being given away to build up the sale of an accessory, the blade.

#### The "Redesign" Phase

"Now the constant effort to reduce selling prices and the accompanying pressure against costs forces manufacturers to redesign products and change materials in the interest of economy. Eventually, however, a competing group reaches the point where any further reduction in raw material or other costs would result in such a drastic cheapening of the product as to set up sales resistance that would more than offset the advantage of a lower price."

Thus every product seems to have before it a blank wall which bars further growth of volume. In fact, if one is in accord with

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**E**VEN before the depression it was becoming apparent that the time-honored mass production formula of lowering prices to widen markets was, in many cases, encountering the law of diminishing returns. The limitations of price appeal are even more evident today when the possibilities of mass economies have been sharply reduced. Consequently more and more manufacturers are turning to style appeal as a means of increasing sales. While the importance of style is still limited mainly to consumer goods, the fortunes of capital goods are based on the successful distribution of consumer products.

Restyling cannot be accomplished "by guess or by gosh" or by waiting for an inspiration. There are definite, systematic ways of doing it. Such methods, as actually applied to a specific product, will be described by Mr. Armstrong in a subsequent article.

The current article is the tenth in our general series devoted to Modern Merchandising and Marketing in the Metal-Working Industry.

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Mr. Armstrong's thesis up to this point, our entire consumer goods industry, seems to be headed for a stage of saturation or stabilization, when the only remaining opportunities for cost reduction will be provided by the market fluctuations of raw materials, which in the long run would give no advantage to any competitor. Such competition would degenerate into nothing more than a cut-throat price struggle. The inevitable outcome would be that prices would be reduced to a level where every sale would bring a loss. It would mean the survival of the strongest. It would mean that those producers which had the largest capital reserve and the greatest financial stamina would stay in the field until enough of their weaker

competitors had been eliminated to permit an advance in prices to a profitable level.

#### Ingenuity Steps In

But Mr. Armstrong does not believe that such a dour future awaits American industry.

"Although both raw material and labor are important factors in costs and are flexible within certain limits until they strike bottom, there is a third element which overshadows the other two and offers an avenue of escape. That is ingenuity. Ingenuity has measured the progress of civilization back to the time when man invented the bow and arrow so that he could kill game beyond the length of his arm. And the unique characteristic of ingenuity is that the more it is applied the less it costs. Through that doorway every manufacturer and every creator can escape when he reaches the blank wall of irreducible material and labor costs. That door is always open.

"Ingenuity can be expressed in many ways. It can take the form of a complete new mechanical design, which is to all intents and purposes a new product. Unfortunately, however, mechanical ideas are God-given and come without regard to time or place or schedule. A man can sit in a corner and strain for a new mechanical idea until he is black in the face. He can finally give it up and go out and play golf, and when his mind is apparently washed free of any thought of the problem an idea may come to him like a flash. In other words, major improvements in technical design are not under control.

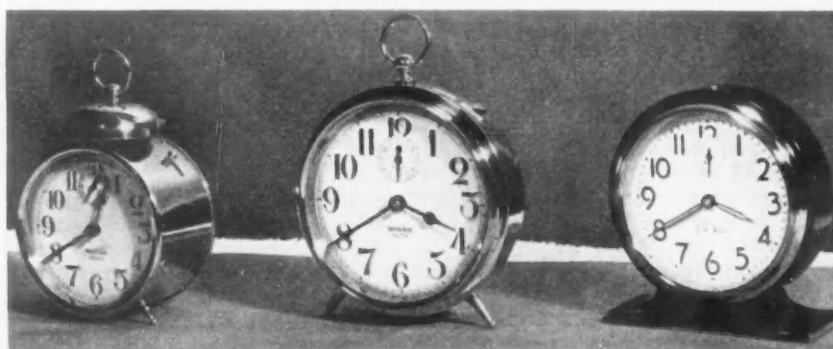
#### Restyling—Ingenuity Under Control

"By way of contrast, restyling is an expression of ingenuity that is under control. It is something that can be scheduled; it is something which by association of ideas also leads to mechanical ingenuity.

"The need for restyling becomes apparent at a definite stage in the life of a given product," Mr. Armstrong pointed out. "If a man invents an electric razor and has the only one in the field, and it has reasonable market appeal, there is no need to restyle it. But if there are six manufacturers making electric razors and

they have all been at it for six years, there is a very definite and sound economic reason for changing the style. In other words, the need for restyling depends entirely on the distribution phase a product is in.

"It is because so many products have reached the point where further economies in (Con. on Adv. p. 14)



FROM MERE UTILITY TO BEAUTY—three stages in the evolution of an alarm clock.



# Correlation of Damping Capacity of Steels With Other Properties

By G. R. BROPHY

Research Laboratory General Electric Co.  
Schenectady, N. Y.

TO determine the influence of degree of previous strain or cold work on  $P$  (per cent damping capacity) a bar of cold-rolled steel was tested in the as-received condition, and at room temperature, after having been heated to various temperatures. The results are shown in Fig. 9.

At intermediate and low stresses,  $P$  increases with the annealing temperature, as would be expected, because of the increased softening. However, there is not the increase that might be expected after a full anneal from 950 deg. C.

Chevenard, on the other hand, reporting the results of a similar set of experiments on cold-worked pure gold wires, shows a decrease in the value of damping capacity with relief of cold rolling effect. None of our results have confirmed his when all stress ranges are considered.

Since cold working influences the value of  $P$ , it was thought probable that the initial stress applied to a test bar would influence the results. This was tested out on steel No. 7 and the results shown in Fig. 10. Here four initial stresses were used and

CONCLUDING his discussion of this comparatively new property of steels, the first portion of which was published in THE IRON AGE, Nov. 24, the author takes up in this article the relation of this property to cold work, composition, creep, fatigue and Charpy values. His experiments show that there is probably no general correlation with other properties with the exception of creep. The relation between damping effect and creep seems logical, he says, since both are a measure of plasticity at very low stresses.

it is seen that, as the initial stress is increased, lower values of  $P$  are obtained. Therefore, care should be exercised in making the damping test not to use excessive initial stresses,

although cyclic stressing previous to an actual test is desirable.

## Effect of Composition

Chevenard's work indicated that the chemically simple steels might have higher damping capacities than those more highly alloyed, and that this is especially true if the added element forms a solid solution. A comparison of Figs. 6 (see issue of Nov. 24), 7, 8, and 10 do not support this. It may be pointed out, however, that the lowering of the damping capacity by heat treatment is in agreement with Chevenard's findings in that an increased amount of solid solution is formed. Thus, it seems that structural composition is an exceptionally important factor and should be given equal consideration with chemical composition.

These properties were determined at a temperature of 450 deg. C, which is a temperature of commercial interest, although for some of the steels investigated it was known that this temperature was in excess of the strain hardening temperature limit.

The total creep occurring in 48 to (Concluded on Advertising Page 10)

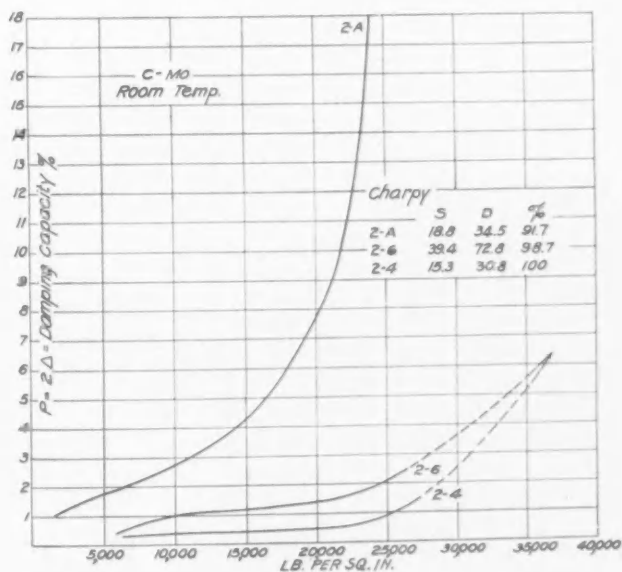


Fig. 7.—Damping characteristics of a molybdenum steel (Steel No. 2)

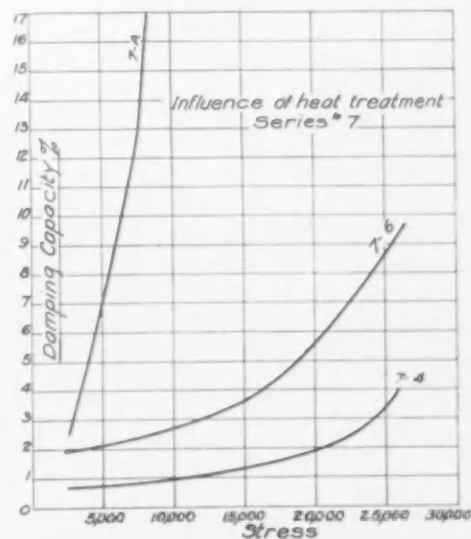


Fig. 8.—Heat treatment and damping capacity (Steel No. 7).

# Improved Handling Methods Speed Output of Auto Bodies

**T**HAT the automobile as a product has progressed by leaps and bounds during the past ten years is well known. But the advance in manufacturing processes back of this improvement in final result is less well known. After ten years of intensive study and plant development, labor-saving methods and equipment are still being introduced into automobile manufacturing sequences.

In no other branch of industry have handling methods received keener scrutiny, and nowhere else have poor handling methods been so promptly cataloged as thieves of profit. In the keen competition of the automotive industry, the producer who has failed to observe and remedy small leaks and unnecessary corners in his production has often found that he has been left behind. In the case of automobile bodies the problem of materials handling constitutes a large part of the total production problem. Yet, unlike stamping, welding or other production processes, the method of transporting material has but a secondary effect upon the quality of the product, and money spent for handling equipment is associated primarily

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By HERBERT R. SIMONDS

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with an increase in speed of production.

The body-building industry was slow to shake itself free from the cumbersome and inefficient methods associated with the manufacture of wagons and carriages, and up to a comparatively recent date the handling of material within this branch of industry was largely a matter of hand trucks of various sizes and shapes. During busy periods delays of unreckoned cost developed, due to congested passageways and lack of traffic regulation. Today overhead conveyor lines, electric industrial trucks, elaborate belt and roller conveyors and production units which themselves are parts of conveyors have eliminated most of this early confusion. Manufacturers of materials-handling equipment were quick to see the handwriting on the wall, and in their enthusiasm they went far beyond the previous role of such manufacturers and took an active part in the overall

design of automotive manufacturing units.

## Costly Shut-Downs Avoided

In the days of the hand truck methods, 45 days represented the average time to produce a complete auto body. At present a much better body is fabricated from raw material to finished unit in four days. The Detroit plant of the Murray Corp. of America has a capacity of 1800 bodies per day of 9 hrs., and to produce this high total, elaborate materials-handling systems have been synchronized and coordinated so that each unit functions in step with each other unit, and insures an even flow of parts from the raw material through to the shipping department. The entire handling system is in charge of a maintenance department, which is given full responsibility for the proper functioning of each important link in the elaborate handling chain. Costly shutdowns due to failure of equipment have been practically eliminated.

The welded construction in body design has thrown the chief production burden on to punch presses, with a constant demand for deeper draws

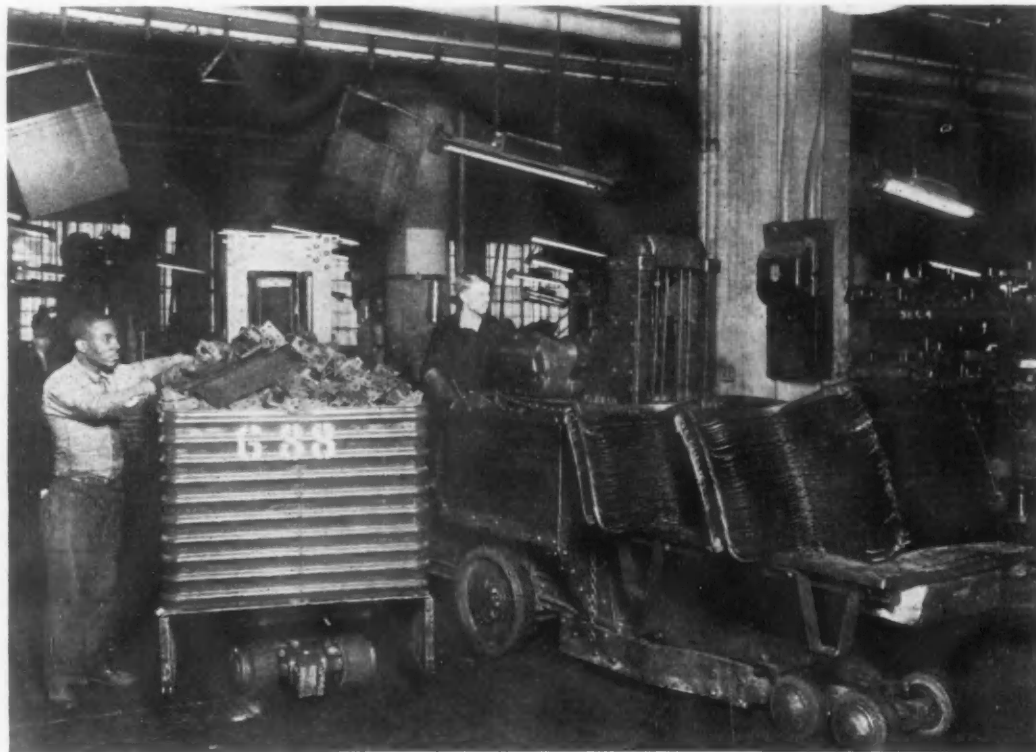


FIG. 1

OVERHEAD trolley conveyors and both motor and hand trucks are used in transporting automobile body parts at the Murray plant



and more elaborate functions. Thus the very foundation of successful manufacture of automobile bodies under present-day operation is found in the die department. The design of dies may alter an entire sequence of processes, and automobile body manufacturers have found that greater attention to this particular feature not only cuts down losses, but often eliminates the necessity of annealing. The trend in automobile body construction has been toward the use of larger and more complicated dies, concentrating two or three or more former operations in a single large multiple draw press.

#### Care and Handling Dies

The die storage department of the Murray plant is considered an important feature in the plant operation. Most of the die blocks are massive, and therefore efficient means of handling are provided. The department is served by an overhead crane, and by a standard railroad track which extends into the room far enough to be served by the crane. Transporting of dies from storage to the different presses throughout the plant is by means of electric trucks. These operate on well-defined aisles which are kept clear at all times. The dies are all provided with rings or bunter holes so they may be easily lifted by the crane and swung over from storage benches to the waiting trucks. Fig. 2 shows a 15-ton storage battery truck handling a massive die.

This die is used on a press weighing 100 tons and capable of exerting a 400-ton pressure seven times a minute. In other words, seven flat sheets

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**M**ASS production methods were slower to develop in automobile body construction than in the building of motors and chassis. Difficulties with wooden brace design and with slow drying paint were two of the chief stumbling blocks. During the past five years automobile body builders have made great strides in overcoming the effects of the slow start, and today with the all-steel welded design and with quick drying lacquers automobile bodies are turned out as rapidly and efficiently as any other part in the construction of automobiles.

An example of modern efficient production of bodies is found at the Detroit plant of the Murray Corp. of America, where the equipment is geared up to a capacity of 1800 bodies per day. To secure this high production it was necessary to give due consideration to the problem of materials handling, and some features in the successful solution of this problem are described in the accompanying article.

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of metal may be transformed into seven fenders per minute. The handling of the die has been worked out so carefully that it is a matter of a comparatively few minutes to slide the parts from storage on to the truck, transport them to the press, elevate them by means of the truck elevating motor to the level of the press bed, and then by means of a winch attachment on the truck, slide them slowly and precisely into proper place.

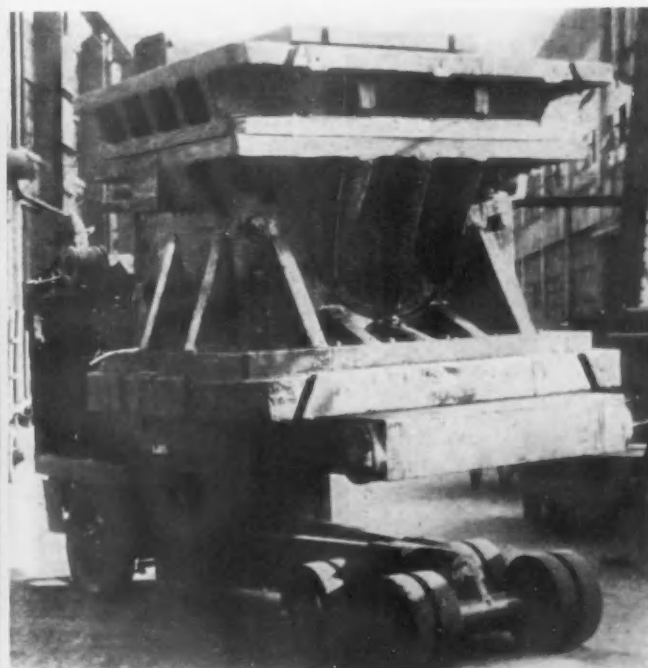
#### Lift Trucks Greatly Reduce Handling Costs

Overhead conveyor lines are used extensively to move process material along production lines. Such overhead conveyors keep material off the floor and make it possible to keep the truck aisles clear. The extensive use of lift

trucks with metal container truck platforms has enabled the department greatly to reduce handling costs. A long row of heavy production presses is served by lift trucks using corrugated steel truck platforms. Most presses have three such platforms conveniently placed, one containing the blanks or incomplete parts, another ready to receive the parts which have passed through the press operation and the third to receive the scrap.

Besides the use of electric trucks and car conveyors, the humble hand truck still has a place, and is still found to be an economical method for short hauls of light material. Fig. 1 shows part of the overhead conveyor system, and also shows two types of electric trucks transporting stampings. Note the wide use of mercury

(Concluded on Advertising Page 12)



**FIG. 2**—The size of the fender die is shown in this illustration. It is transported quickly and efficiently by means of electric lift trucks

The finished bodies (at left) descend on chain conveyors from the glazing and painting department to the shipping platform



# Transporting Hot Ingots at Cambria Works

By D. E. RENSHAW

General Engineer, Westinghouse Electric & Mfg. Co.,  
East Pittsburgh, Pa.

**I**N a recently completed rearrangement of soaking pits for the 48-in. blooming mill at the Cambria Works of the Bethlehem Steel Co., the company's engineers have provided for rapid, precise ingot transportation a remotely controlled car which is automatically accelerated and retarded and which can easily be spotted with an accuracy of plus or minus 6 in.

The soaking pit furnaces, of which there are six, are placed as closely adjacent as possible to the mill. Each furnace has four holes making a total of 24, each of which in turn has capacity for four to six ingots, making a total average capacity of 120 ingots.

There are six conductor rails for power and control, mounted one above another at the side of the furnace wall, and the car track is closely adjacent to the furnaces.

The ingot car is 92½ in. wide, 90 in. high and 170 in. long. On account of the possibility of dropping ingots on the car, the truck frames are made of heavy slabs, and the sides of the superstructure of thick plates, strongly reinforced by vertical and gusset plates. The top, on which the ingots are carried, consists of a heavy plate on which are placed 6-in. channels back to back topped by cross bars approximately 4 in. square. Weld-

ing was used extensively in assembling the chassis, and the superstructure is entirely of welded construction. The superstructure is bolted to the chassis. The journal boxes are equipped with Timken bearings, and carry the weight through flexible coil springs. As indicated in the illustrations, the appearance of the car gives the impression of thorough sturdiness.

In the normal production schedule an ingot must be delivered to the mill each minute of the day during 20 working hours. This requires rapid acceleration, deceleration and running of the car, prompt loading and unloading and the elimination of false movements or spotting delays at the ends of the run.

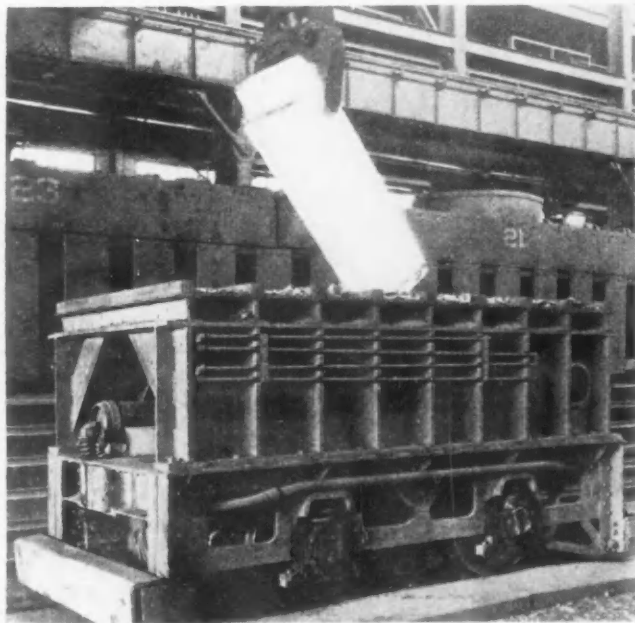
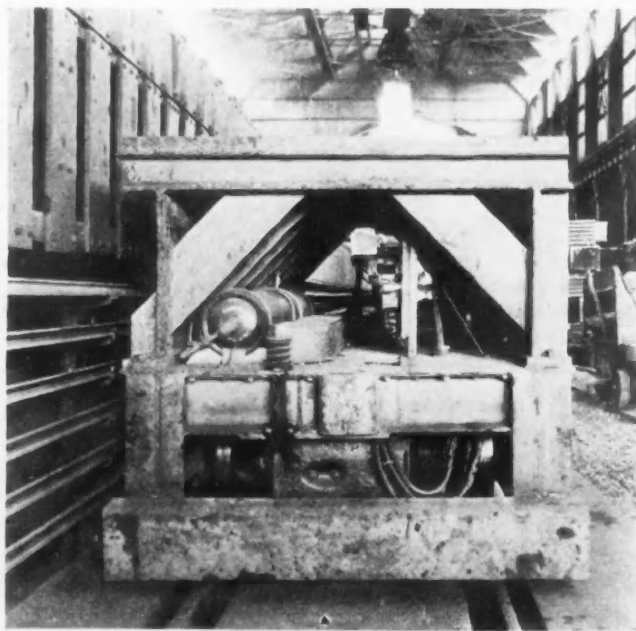
Rapid acceleration is obtained by definite time automatic control, and corresponding deceleration by dynamic

braking, which is automatically applied when the car reaches the slow down rail. Two 150-hp. motors provide tractive effort to accelerate with load from standstill to 12 mph. in 4 sec. and to slow down from 17.5 mph. to 4 mph. in 7.7 sec. The motors are of the mine locomotive type, series wound, with commutating poles, and arranged for forced ventilation to take care of the maximum mill production with moderate motor heating.

After the car has been slowed down to about 2 mph., which occurs very close to the point where the stop is to be made, the car is quickly brought to rest at the spot desired by air brakes which are automatically applied when the controller is placed in the "off" position.

The electrical equipment on the car has been kept to a minimum, and includes only those items which could

**M**OUNTED on the side of the soaking pit furnaces are six conductor rails for power and speed control of the ingot car. (At right.)



**I**NGOT car, which is electrically propelled under remote control, carries its own air-compressing and air-braking apparatus, automatic in operation. (At left.)

not possibly be mounted elsewhere. In this list there are, in addition to the traction motors:

A line contactor, controlled by an air pressure relay, which can be closed only when normal air pressure is available for operating the brakes. Therefore, the car cannot be started until adequate braking force is available.

The compressor and the automatic brake application and release valve.

The blower motor and its starter.

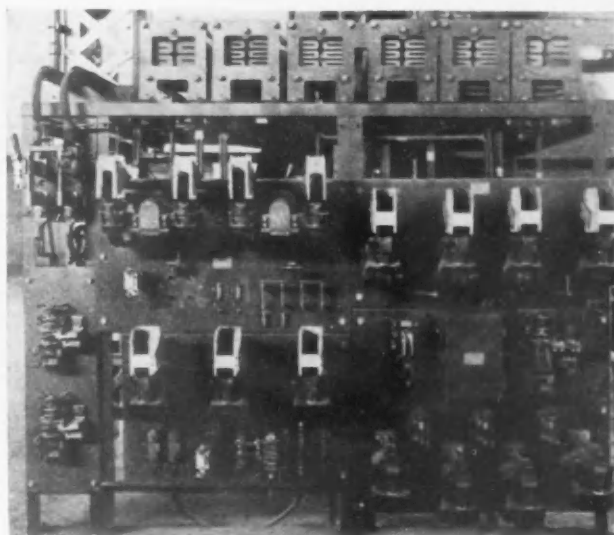
The reversing, accelerating and braking contactors and relays and the main resistors are mounted separately from the car on a platform, as shown in one of the illustrations. These items which periodically require attention are thus placed so that inspection and maintenance may be easily accomplished with thoroughness.

The master controller is placed at the floor level near the mill, with a handle directly on the controller and a second handle on an extended vertical shaft in reach of the emergency crane operator, who normally controls the movements of the car. At present, the motors are connected permanently in series, but provision has been made for parallel operation, which will result in cutting the car running time in half.

While the car is on its way to the mill, the pit attendant selects the furnace from which the next ingot is to be taken and closes the corresponding switch, which lights a signal lamp and energizes the slow down rail for that section (except for furnace No. 6 which is always energized). When the ingot has been discharged from the car, the emergency crane operator moves the controller handle to the full forward position, causing power to be applied to the motors and the brakes to be released. The car is then automatically accelerated to full speed toward the pits.

For example, let us assume that furnace No. 5 has been selected. Until rail section marked pit 5 is reached, the car will continue to run at full voltage. At this point, the circuit

EXCEPT for a minimum of electrical apparatus on the ingot car, all of that required for reversing, accelerating and dynamic braking is mounted separately from the car, for easy inspection and maintenance.



for contactors will be established, which contactors close a resistance circuit in parallel with the armatures to establish dynamic braking, which rapidly brings the car speed down to about 2 mph. At this speed, the armature current will again have reversed, giving sufficient propelling tractive effort to move the car at this balancing speed until the controller is moved to the "off" position, causing power to be cut off, and air brakes to be applied.

After the ingot is placed on the car, the controller is placed at once in the full "reverse" position, causing the car to accelerate toward the mill. The car always approaches the stop at about 2 mph., permitting the air

brakes to stop the car quickly when the power is cut off.

At the mill the ingot is removed from the car by an electrically operated pusher, carrying with it the scale which drops onto a deflecting plate and to the ground from where it is periodically removed.

This system of ingot transportation permits ingots to be placed in the pits either butt or top end down and later withdrawn and placed on the car to enter the mill either end first as the grade of steel and best mill practice may require. No intermediate handling is required, as the ingot may be swung toward or away from the mill as desired when it is placed on the car.

## Slag Granulating Machine Recovers the Iron

EDGAR E. BROSIUS, INC., Pittsburgh, has recently developed and placed in operation an unusual and interesting machine for removing the molten iron from the molten slag in blast furnace or open-hearth operation. The iron is recovered by means of centrifugal force and the slag is then granulated, making for the recovery of the free iron in a usable form. This is done by the machine shown in the photographs.

A spinning pot or centrifuge is mounted on a vertical motor inside of a retaining shell, and water sprays in sufficient number are provided so that the slag, free of iron as it leaves the lip at the pot, is granulated. The first installation of this machine was made at the plant of the Davison Coke & Iron Co., Neville Island, Pittsburgh.

It has been a much disputed point in blast furnace practice as to how much free iron is actually lost in the slag

from the blast furnace. Some operators claim as low as ½ per cent, while others say this loss amounts to 4 per cent, and sometimes as high as 6 and even 9 per cent of the weight of slag.

The Brosius machine proves what the loss amounts to. In one instance of a flush lasting 15 min., 5,000 lb. of iron was recovered, although no iron apparently was flowing, as this was coming out of the monkey as free iron underneath the slag stream.

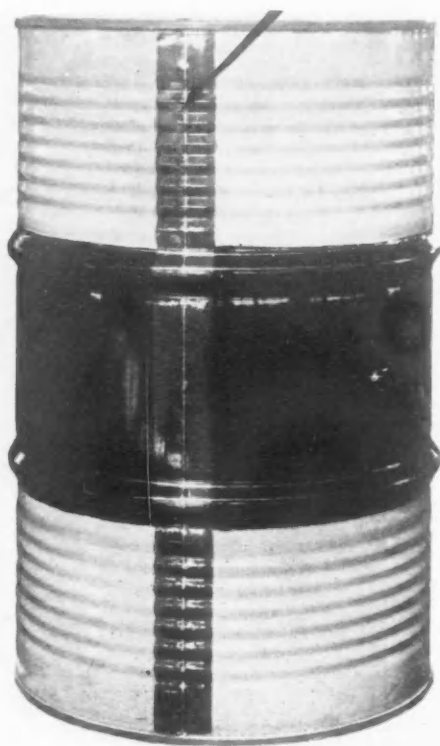


The Brosius slag granulating and iron recovery machine (Above) is located at one end of the cinder pit near the furnace. Slag is flowing into the pot as it is spinning and the water sprays granulate the slag as it leaves the lip of the pot. The heavy iron is deposited on the periphery of the pot by centrifugal action.

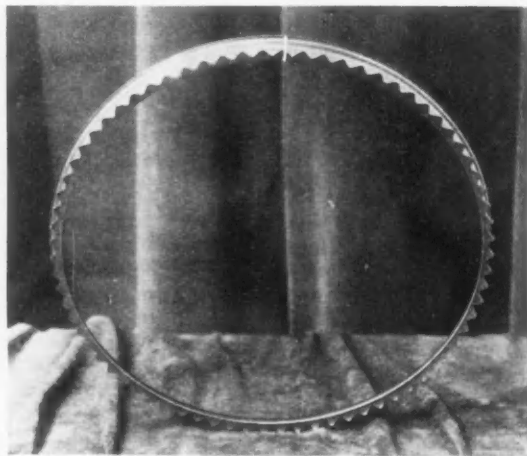
Typical rings of iron (At Right) recovered from the pots after a run of slag. These will vary from a small ring up to a full chunk weighing 3000 to 4000 lb.

# "Better Times"—

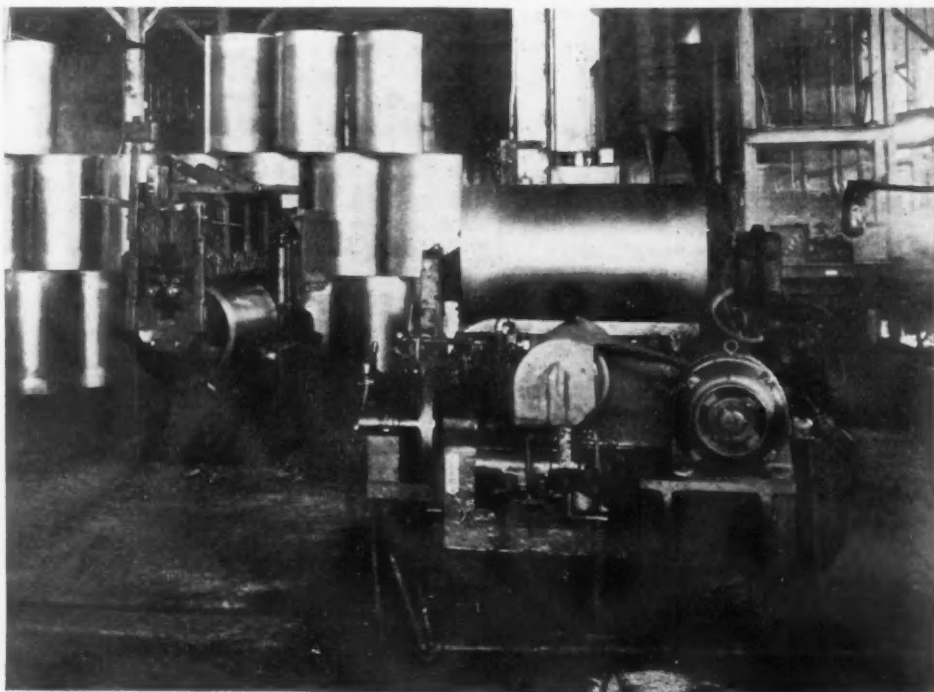
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Flash Welded  
Steel Barrel.  
Production—  
140 barrels per hr.



Ornamental Automobile  
Wheel Rim  
Production—250 per hr.





## OPERATION: Electrical Resistance Welding

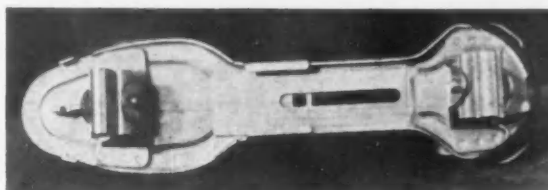
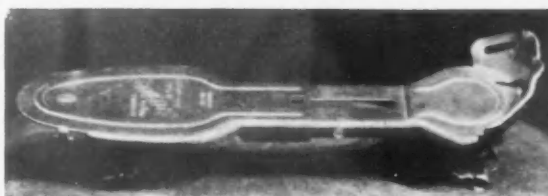
### PRODUCTION EQUIPMENT: Federal Spot, Projection, Seam and Flash Welders

#### ▲ ▲ ▲ SPEED WELDING

**W**ELDING as an operation in the manufacture of machine elements and metal articles is a relatively new fabricating agent and it is only in recent years that high speed production equipment in this field has been developed.

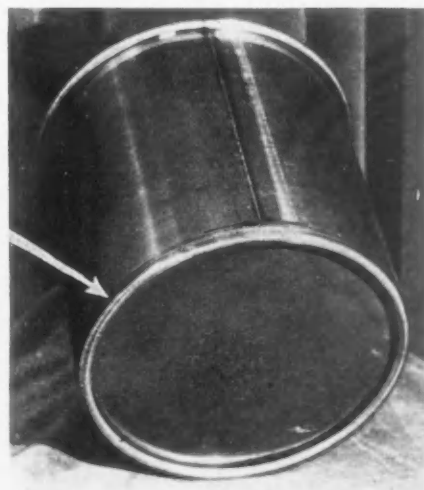
The products of several modern types of manufacturing welders are shown in this, the thirteenth in a series of production pages taken from actual practice.

One only of the several welding machines included in the report for these pages is shown. This is a resistance welder and stripper used in production of barrels, pails and small drums. The arrows on the various products point to the welds referred to in the production time date.



#### Projection-Welded Roller Skates

Production—front wheel truck assembled to front toe plate by 6 projection welds and rear wheel truck assembled to heel plate by 6 additional projection welds. Both operations—5 skates per minute.



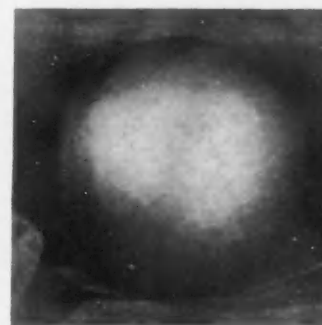
#### ▲ ▲ ▲ Resistance Welded Steel Pails

Production—  
12-in. side seam, 450  
welds per hr.  
33-in. circular seam,  
250 welds per hr.

#### ▲ ▲ ▲ Flash Welded Hollow Steel Ball

Hemispherical hollow steel forgings are joined to make a ball 6 in. in diameter.

Production—  
100 balls per hr.



## Ratchet Burring Reamer Has Spiral Flutes

FOR removing burrs quickly and easily from the inside of pipe, the Greenfield Tap & Die Corp., Greenfield, Mass., is offering the new ratchet burring reamer illustrated.

This tool, designated as the No. 246-R, has spiral flutes, which gives it



a shearing action, said to result in easy cutting, and at the same time feeds the tool into the burrs, so that great pressure on the stock is unnecessary. The ratchet head is completely inclosed to protect the moving parts from dirt and burrs. The polished tubular handle is light in weight. Although designed primarily for use on pipe ranging from  $\frac{1}{4}$  to 2 in., the tool can be used for other purposes, such as enlarging holes in sheet metal and countersinking.

## Automatic Reel Guide for Strip Steel

AN automatic reel guide to be used in the coiling of strip steel has been developed by the United Engineering & Foundry Co., Pittsburgh, and given tests over a period of several months. The machine receives a cold-rolled strip as it emerges from a mill, straightens and keeps it from curling or bending, inserts the end in the entry slot of the reel, starts the reel in motion and withdraws to allow the coil to build up. It is completely automatic.

The United company introduced the automatic hot strip reel which takes



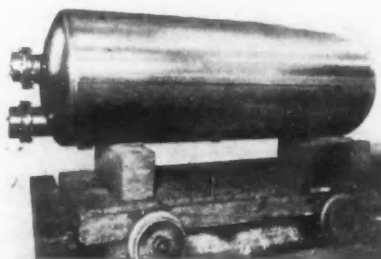
Cold rolled strip about to enter the automatic reel guide is shown at left. At the right the strip is entered and is coiling

a strip at full delivery of the mill, but, heretofore in cold-rolled strip steel, where tension on the strip during the rolling operation is of great importance, automatic reels have not been widely used. In non-ferrous metals, where tension is not so important, there have been coilers to take strip from the mill at full speed for some years.

It has been pointed out that on any wide steel strip, the end is likely to curl and twist. With the automatic reel guide it is simple to get the strip into the reel, eliminating mill holdups and protecting the operator from danger. On the score that the new machines must function as one unit in the complete reel assembly, to show successful results, the reel guides will not be applied at present to any reels not built by the United company.

## Laundry Installs Nickel-Clad Water Heater

THE first nickel-clad steel water storage heater installed on this continent was placed in service in February of this year at the Jolicoeur



Laundry, Ltd., Montreal. The heater is of 1000-gal. capacity, tested to pressure of 135 lb. per sq. in., and operating at working pressure of 90 lb. per sq. in. The shell was formed from one nickel-clad plate, 149  $\frac{3}{4}$  in. by 119 in. by 5/16 in., with 10 per cent cladding. The two heads were formed from 7/16 in. nickel-clad steel, also

10 per cent clad. The heater is of welded construction, with the continuity of the pure nickel interior preserved by welding with nickel to close the break in the clad surface at the joints. Outside welds are ordinary steel welds. The heater was fabricated by the Montreal Locomotive Works, Ltd.

Nickel-clad steel is a joint development of the International Nickel Co., New York, and Lukens Steel Co., Coatesville, Pa. [A description of this new product was published in THE IRON AGE, July 23, 1931, and Dec. 3, 1931.] H. Jolicoeur, secretary and treasurer of the Jolicoeur Laundry, states that the nickel-clad storage heater has entirely eliminated rust in the laundry's hot water supply.

## Control Instrument Has Rotating Contacts

A NOTABLE development in the field of contact-type electric controllers has been made by the Foxboro Co., Foxboro, Mass. It is called the Rotax to indicate that it stands for rotating contacts and utilizes the advantage of the accurate control of the commutator type of instrument, securing positive contact of the pen with a minimum of arcing.

The Rotax controller is used to control temperature, pressure, humidity, flow or liquid level and to give audible or visible signals. It is designed to operate valves, compressors, blowers, motors, heating units, horns, and lights. Its applications include temperature control of ovens and furnaces (annealing, baking, enameling, drying), tempering baths and solder and babbitt melting pots; also pressure control of gas lines, air lines or lines of other fluids; and humidity control of drying ovens, storage rooms and air conditioning equipment.

If it is desired to control time, a special time cycle feature may be added.



Rotax controller for temperature, pressure, humidity and other regulation employs rotating contact to secure positive electric connection at all times.

## Bench-Type Diamond Boring Machine

THE Cimatool bench-type diamond boring machine illustrated is one of three new types recently completed by the City Machine & Tool Works, Dayton, Ohio, to meet a wide range of applications. It is adapted for boring such parts as bronze or babbitt bushings in end frames of small electric motors, wristpin bearings in small refrigerator pistons and many similar pieces. Holes up to  $\frac{3}{4}$ -in. in diameter can be bored. After the operator places the work in position and starts the machine, the cycle of operations is automatic and the machine stops after the bore has been completed. Designed for high production, the machine is specially tooled for the job on which it is to be used.

The particular unit illustrated is equipped for boring the bronze bushing in a motor end frame. After the work is put on the magnetic chuck, one of two electric switches is pulled forward to energize the chuck and hold the work in place. The operator next pushes the exhaust tube against the end of the work, so that the borings may be carried away, and then he closes the second electric switch to start the machine.

Current for the driving motor is passed through the magnetic chuck in such a way that the starting switch is inoperative unless the chuck is energized and is holding the work securely. With both switches closed the spindle starts rotating and feeding the boring tool through the hole to be finished. The spindle is fed forward against the tension of a spring.

After the bore has been completed an automatic trip opens the switches and thereby cuts off the current from the driving motor. Simultaneously,

an electrically-operated friction brake stops rotation of the spindle; the clutch that controls the spindle feed is also released so that the spring may withdraw the spindle to the starting position. As the spindle has stopped rotating before its return motion starts, there is no tendency for the tool to produce a spiral scratch in the finished bore. A cooling system can be furnished for machines of this type.

## Motorized Speed Reducer

MOTORIZED speed reducers capable of employing nearly any type of motor have been placed on the market by the Louis Allis Co., Milwaukee.



One type of these units has the motor closely coupled to the gear casing.

waukee. The motor and speed reducer are combined into a single, compact, self-contained unit. Ratings available are  $\frac{3}{4}$  to 75 hp. with output speeds 4 to 400 r.p.m.

Efficiencies as high as 97 per cent or more are emphasized, a result of a minimum number of rotating and wearing parts and the use of precision gears and pinions with over-sized ball bearings.

The integral style shown in the at-

tached cut, in which the end-bell is removed and the motor close-coupled to the gear casing, is most common where an open motor or inclosed non-ventilated motor is employed.

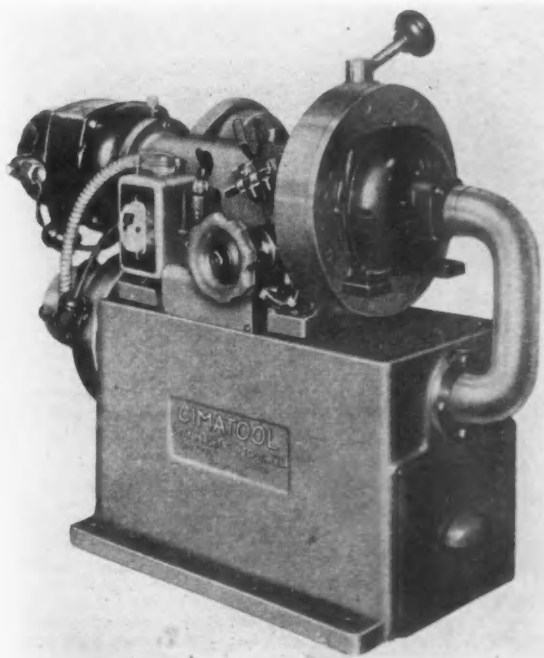
## Machine for Burring Axle-Shaft Bevel Gears

FOR use in a large automotive plant, the City Machine & Tool Works, Dayton, Ohio, built the special two-spindle burring machine illustrated, which is designed to remove the burr thrown up in hobbing the bevel gear on axle shafts.

Each spindle operates independently of the other, so that one station may be loaded while the other is in operation. Rapid manual clamping of the work is a feature. The clamping mechanism is of simple construction, and provides positive, non-slip action with a short travel of the clamping handle. It is stated that although the production time is regulated by feed, and would vary somewhat with the amount of material to be removed, this machine is capable of a 6 sec. cycle when utilized simply for burring.

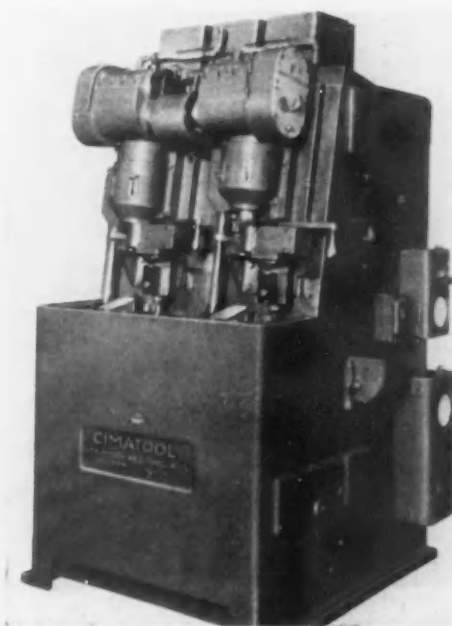
The machine is rugged in construction and is equipped with four motors for driving the spindles, cam feed mechanism, and coolant and lubricating pumps. A self-oiling system is standard equipment.

H. A. Brassert & Co., Ltd., of London, the British branch of H. A. Brassert & Co., 310 South Michigan Avenue, Chicago, has been awarded the contract to design and supervise the construction of a new iron and steel plant to be built by Stewarts & Lloyds at Corby, England.



**B**ENCH machine (at left) equipped for boring bronze bushings. After the work is placed on the magnetic chuck, the cycle of operations is automatic.

**B**URRS thrown up (at right) in hobbing the bevel gear on automobile axle shafts are quickly removed on this two-spindle machine.





# Stainless Clad Steel Readily Formed into Tanks

**M**UCH has been said and written about stainless clad steel in the few months since it was introduced. Now actual evidence of use of the material is coming to light, as several worthwhile installations have demonstrated the practical advantages of this material in several fields of application.

In the plant of the Marsene Corp. of America, Gary, Ind., a transparent paper is manufactured which involves a highly technical chemical process. The solution from which the paper is made must be entirely free from contamination of any kind. The slightest trace of rust in the solution will discolor the finished product.

This company has found, after experimenting with several types of tanks, that stainless steel was the ultimate solution to their tank problem. In considering the stainless steels they learned of stainless clad steel, having apparently all of the advantages of solid stainless steel, and at the same time, reducing the cost of the finished tanks.

Two steam-jacketed Horton tanks of 770 gal. capacity each (Fig. 1), were constructed by the Chicago Bridge & Iron Works of the stainless clad steel produced by the Ingersoll Steel & Disc Co., Chicago. The tanks are 5 ft. 6 in. inside diameter, 4 ft. high, having a 6-in. self-draining dished bottom,

BY S. L. INGERSOLL

Vice-President in Charge of Research, Ingersoll Steel & Disc Co., Chicago (A Division of Borg-Warner Corp.)

with the low pressure steam-jacket extending 2 ft. 6 in. up from the bottom. The walls and bottom of the tank coming into contact with the solution were constructed of 3/16-in. gage stainless clad steel having an 18-8 stainless surface, with all joints V-welded using stainless steel welding rod. The top of the tanks were constructed of No. 7 gage stainless clad steel having an 80 per cent thickness of mild steel foundation. Several openings in the tanks were necessary for charging pipes, agitator shaft, and drains. Stainless steel fittings, welded to the tank using stainless welding rods were used throughout. All piping used to and from the tank was brass. The agitator shaft and propeller were made of bronze. Thus these two tanks are completely protected on the inside against attack by corrosion.

In the construction of the tanks there was the usual apprehension as to whether there would be any separation of the stainless steel surface from the mild steel foundation in

forming the dished bottom of the tanks. E. M. Kratz, secretary-treasurer of the Marsene corporation says, "We have found that there was not the slightest separation of the two plys, and the tanks have been satisfactory in every respect. Whereas we normally allow our solution to remain in the heating tanks from 4 to 5 hrs. we have allowed it to remain 12 hrs. in these new tanks without any trace of rust discoloration being evident in the solution at the end of that time."

The apprehension held by this company as to whether the two plys would show any separation in forming or deep-drawing is only a natural doubt expressed by nearly every early user of stainless clad steel. This doubt is removed when the user understands that the rustless surface is thoroughly welded to the mild steel foundation in the ingot, before the material is rolled. A patented process has been developed that absolutely assures this perfect bond between the two surfaces. Neither physical strain nor the difference in the coefficients of expansion under heat have been able to separate the two plys.

Fabricating the material presents no more problems than fabricating a mild steel of like gages. Because the mild steel forms such a large portion of the composite sheet of the stainless clad steel, fabrication may be handled with the same equipment used for mild steel. The clad metal may be deep drawn, as shown in Fig. 2 of the washing machine tub; it may be stamped, formed, spun, beaded, braised, welded and soldered.

In welding, a stainless steel rod should always be used at the stainless surface. In the thicker gages economy may be effected by using an ordinary (Concluded on Advertising Page 14)

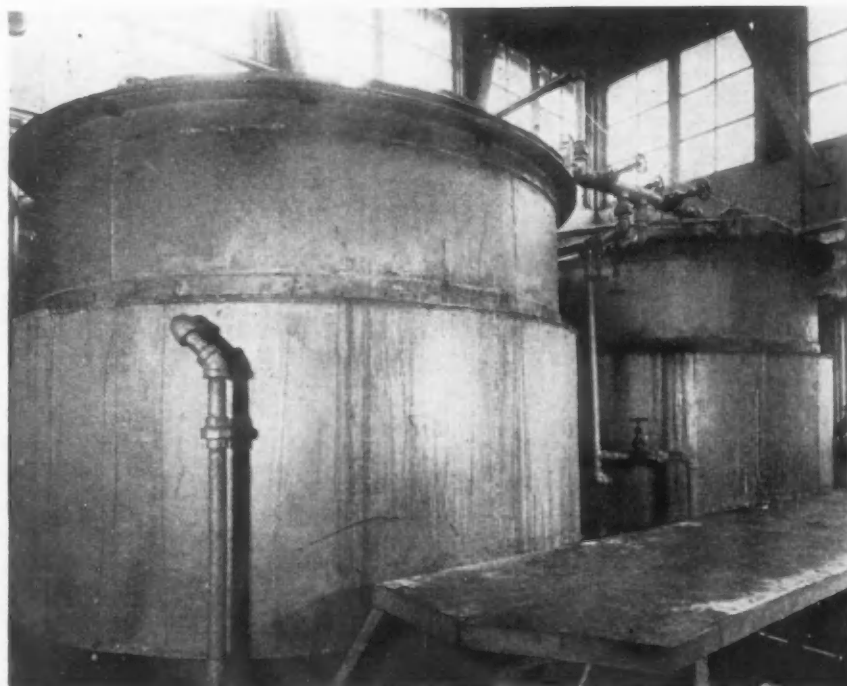


Fig. 1—Two 770-gal. steam jacketed tanks in plant of Marsene Corp. of America, Gary, Ind., having all inside surfaces of stainless clad steel.

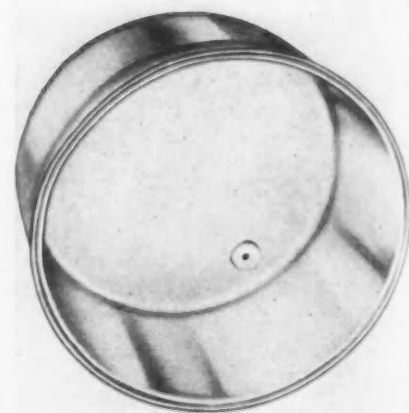
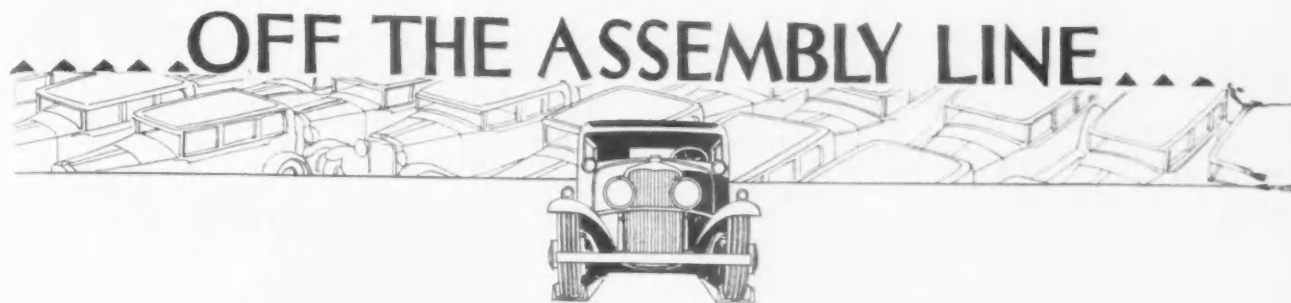


Fig. 2—Washing machine tub illustrates deep drawing possibilities of stainless clad steel.



Fig. 3—Sharp bends show no interruption between stainless surface and mild steel foundations of combination metal.



## Detroit Expecting Higher Automobile Production in January

DETROIT, Dec. 27.

**T**HERE has been no letdown in operations by motor-car companies, and total assemblies for December should be about 110,000 units. With Chevrolet likely to show a gain rather than a decline and with Ford certain to expand its activities, January promises to record a better performance than this month. In fact, a number of manufacturers who did not get into full swing until late in December have scheduled a fair production run during the next 30 days.

The industry is expected to maintain activities near the present level up until the middle of February. The puzzle which executives must solve is what is going to happen after that date. The shows will be over, dealers stocked and the first rush of orders filled by then. Production naturally will depend on what course retail sales take, but no one is willing to venture an opinion regarding what that course will be. One policy to which all companies will strictly adhere is to hold production in line with sales. The fact that operations will be sustained at or close to the current rate for at least the next six weeks, thus giving employment over that period to thousands of workers, without putting excessive stocks of new cars in dealers' hands, is a happy result of careful planning by the managements of automobile companies.

### Chevrolet Best Steel Customer

Chevrolet continues to be the largest individual consumer of steel, its releases against contracts having been of liberal proportions. Ford has done nothing further in steel since its recent purchases of sheets for bodies, but the steel trade anticipates sizable orders in the next few weeks. Chrysler is expected to place its first quarter contracts this week and at the same time give releases covering January requirements. Pontiac is about to

December motor car output estimated at 110,000 cars, with an increase anticipated in January.

\* \* \*

Steel releases continue at fair rate. Fisher Body buys steel for Cleveland plant.

\* \* \*

Ford has tentatively scheduled 20,000 cars for January.

▼ ▼ ▼

buy steel for immediate delivery, while Reo the past week contracted for steel for its passenger car and truck needs. Fisher Body Corp. has given new releases of sheets for its Cleveland plant, which is working on Chevrolet bodies. Buick should place some steel business this week, but the tonnage may not be large. Packard, likewise, is considering a steel buy in the immediate future.

Although Chevrolet had hoped to make 60,000 cars this month, it has been hampered by the difficulty in securing bodies so that its total assemblies will be 50,000 to 55,000 cars. It is understood that its January schedule will be augmented by whatever number it fell short of its December goal; this insures a production next month greater than that of December. Chevrolet had about 40,000 retail orders on hand when its car was announced on Dec. 17, and attendance on opening day throughout the country at dealers' showrooms totaled over four million persons. The company's management is genuinely encouraged at the reception given the new car and is convinced that it was right in holding to the program of building a bigger and better car for the same money rather than follow-

ing the trend of others in cutting down the size in order to lower prices.

### Ford's January Schedule 20,000

Ford is said to be committed to a schedule of about 1000 cars a day, five days a week, during January, or a total output for the month of 20,000 cars. However, it has not yet given volume releases to parts makers. Oldsmobile will make approximately 5000 cars in January and Pontiac 7000. The new Pontiac, to be revealed to the public tomorrow, will have a base price of \$585 for the straight-eight models. This will put it directly in competition with the Dodge six, the price range of which is about the same as Pontiac's. The new Pontiac will have a 77-hp. motor of "L" head design, with a bore of 3 3/16 in. and stroke of 3 1/2 in., giving a displacement of 223.4 cu. in. Pistons are electro-plated, and the frame is 5 3/4 in. deep and 2 1/4 in. wide. Springs are of chrome vanadium steel 1 3/4 in. wide. The car has synchro-mesh transmission with helical second speed; rubber insulation is used at 38 points throughout the car. The four-door sedan weighs 2265 lb.

Graham-Paige will have two standard and one custom line of cars next year, with the general design little changed from current models. It is deriving much satisfaction from the fact that it can advertise that it is "the most imitated car" in the country. Packard will have two eights and a twin-six, as at present, and Cadillac will continue to offer a V-eight, V-12 and V-16 and a LaSalle eight. Neither Packard nor Cadillac will make major changes. De Soto, still a six, will have a 79-hp. motor, high compression cylinder head, automatic starter, free wheeling and an all-silent transmission similar to that on the new Dodge. For the past year the trend has been toward the elimination of the cowl; on the new De

Soto it will reappear to a certain extent through curving the rear of the hood on top of the cowl away from the windshield at the center. The price of the business coupe is \$695.

#### Detroit Notes

Great Lakes Steel Corp'n. took off one open-hearth furnace for repairs the past week and now is operating five out of six furnaces . . . Detroit's employment on Dec. 15 stood at 44.2, according to the index of the local Board of Commerce, compared with 39.3 on Nov. 30 . . . Front springing on the new Continental four will be by means of a single transverse member, but in the rear double quarter-elliptic cantilevers are used . . . The boatload of scrap delivered by water to the Chrysler foundry last week is said to have left Milwaukee one hour before the season's time limit on insurance expired. The boat was caught in ice floes at Detroit and was docked with difficulty. The season's last boatload of sheet bars destined for Monroe from a Cleveland mill likewise was delayed because the boat became wedged in an ice jam, but finally managed to extricate itself . . . The sharp decline in automobile production this year played havoc with water shipment of steel. One steel company, which has gone in for water delivery to Detroit on a large scale, delivered by boat in 1932 only 30 per cent of the tonnage thus transported in 1931. Moreover, the 1931 tonnage was but 66 per cent of that in 1930, when total tonnage shipped to this city by water reached its peak . . . Although there is considerable price cutting not only direct, but in the form of the elimination of extras, many steel consumers are not deserting their regular sources of supply because of such bait. In fact, one of the more important automobile companies did not ask for bids on its forging stock for the first quarter, preferring to go along with its present suppliers who admittedly are getting little enough for their steel as it is . . . Despite reports to the contrary, Reo will continue in the passenger car business and shortly will introduce new Flying Clouds and Royales, the latter at a considerable reduction in price.

### Bethlehem Shipbuilding Awarded Cruiser 39

WASHINGTON, Dec. 27.—The Bethlehem Shipbuilding Corp'n., Ltd., Quincy, Mass., has been awarded the contract to build the cruiser C-39. The vessel will require about 7000 tons of plates.

A. M. Byers Co., Pittsburgh, has issued an interesting and informative 14-page treatise on pipe bending, giving a clearly illustrated description of the technique in hot and cold bending of wrought-iron pipe.

## Proposes Tax to Meet Depreciated Currencies

WASHINGTON, Dec. 27.—Representative Samuel B. Hill, Democrat, of Washington, has introduced a bill to provide employment for American labor, encourage industry and agriculture and prevent loss of revenue to the Treasury by supporting the dollar in its battle with depreciated foreign currencies.

A flood of imports from more than 40 countries which are off the gold standard has caused widespread complaints from American farmers and manufacturers to Congress, to the Commissioner of Customs, to the Chamber of Commerce of the United States and to other civic agencies.

Representative Hill claims that the bill goes direct to the heart of the problem by authorizing a tax on imports from such countries equal to the difference between the value of the dollar and the value of the depreciated currency of the exporting country at the date the shipment is made.

A survey by economists shows that thousands of jobs will be created by this legislation, because goods produced in depreciated currency countries no longer will have the dollar at the great disadvantage it now suffers from competition with the cheaper monies.

## River Shipments of Steel Gained in November

Shipments of iron and steel products on the Ohio River in the Pittsburgh district during November amounted to 45,735 net tons, according to the United States Engineer Office, Pittsburgh. The previous month's shipments were 40,399 tons, while 42,247 tons was moved in November, 1931. Monongahela River commerce in iron and steel in November totaled 29,851, compared with 24,305 tons in the preceding month and with 24,338 tons in the corresponding month last year. On the Allegheny River 23,225 tons of iron and steel was moved in November, 21,280 in October and five tons in November, 1931.

## Freight Surcharges Up for Hearing This Week

WASHINGTON, Dec. 27.—Opposition to the petition of railroads for continuance of surcharges after March 31 will be received by the Interstate Commerce Commission on or before Jan. 15. Hearing has been set for tomorrow to receive evidence of the railroads and others in support of the carriers' petition. The commission has announced that other interested parties may file sworn statements. Wit-

nesses will be subjected to cross-examination if that is deemed necessary. Those desiring to be heard orally, the commission has stated, must immediately file a statement indicating the time desired and the nature of evidence to be presented so that the commission may determine if it will hear oral arguments.

The commission, in reopening the case, will do so on the following points only:

Shall the surcharges at present in effect under the previous findings herein be permitted to be continued by filing upon short notice tariffs similar in character to those by which they were originally made effective?

If such surcharges are continued, during what period shall they be permitted to remain in effect?

Shall permission to continue such surcharges, if granted, be without condition as to disposition of the revenue accruing therefrom?

## Cleveland Hardware Co. Is Reorganized

Cleveland Hardware & Forging Co., Cleveland, has been formed as a reorganization of the Cleveland Hardware Co., manufacturer of forgings. In the reorganization the par value of the stock has been reduced from \$100 to \$20 per share. T. P. Robbins, president and treasurer of the old company, occupies similar executive positions with the new organization. A. J. Sanford has been elected vice-president, secretary-treasurer and general manager. Mr. Sanford was formerly connected with the Timken Roller Bearing Co., and later was sales manager of the Timken Steel & Tube Co., Canton. Charles E. Adams, chairman of the board of the old company, holds a similar position with the new organization.

## R.F.C. Loan of \$500,000 For Mississippi Levees

WASHINGTON, Dec. 27.—Construction of levees on the west bank of the Mississippi River opposite Memphis, Tenn., by the War Department has been assured by the approval of a Reconstruction Finance Corporation loan of \$500,000 to the St. Francis Levee District, public agency of Arkansas. The money is to be used to purchase rights of way for the levees whose cost for the Federal Government is estimated at \$9,223,000.

The War Department has promised the State of Arkansas that construction will be begun as soon as the Levee District provides the right of way. The construction work, the R. F. C. announced, will provide employment for about 3000 men for two years. No estimates of steel and other requirements were made.

The R. F. C. has also approved a loan of \$187,500 for the building of a public market in Dallas, Tex.



# • • EDITORIAL COMMENT • •

## Bank Credit Based Upon Selling Prices

IN the past, bank credit has been based upon character, management, earning capacity and collateral, singly, or in combination. In these abnormal times, the ability to produce a satisfactory earning statement has been sadly diminished. Character and management, while unquestionably improved by the trials of depression, have passed out of the credit picture as seen by the average banker. Collateral if gilt-edged is still "good for a loan," but it, too, has been so depleted in many cases as to be unavailable for credit purposes.

If industry and business are to continue to function and if banks are to continue to do business, some adequate basis for the extension of credit must be found. A spokesman for an important branch of the metal-working industry suggests that it be the maintenance of an adequate selling price.

"When sales are made at a loss," he says, "the manufacturer is shipping a part of his assets along with the material. Further, the seller is destroying whatever price structure he may have made for himself. This will take a long time to correct if it is ever possible to do so. He has probably lost the respect of his customer who is buying on account of low price. The buyer doesn't know when he has the best price that he can get. As a consequence, much purchasing is being held up today because the buyer feels that delay may cause prices to go still lower. In addition to that, the cut-throat seller has made his company a nuisance to the industry of which he is a part, and is destroying other units that are attempting to maintain sound business principles.

"Many of these companies are going along now without calling for bank accommodations, having lived for two or three years on such cash as they may have accumulated on their accounts receivable, from inventories and possibly through the grace of their material creditors.

"With business on the upturn, these companies will be looking for credit accommodations from their bankers and from their vendors. When they attempt to arrange this accommodation they will undoubtedly be faced with a different sort of questioning than heretofore. Their balance sheets and operating statements will give little on which credit can be based.

"The credit analyst will have to use a different yardstick and will undoubtedly look once more at product and at management. When he looks at management, even though sales are a small percentage of capacity, he is very likely to inquire as to the price received for what has been sold in relation to a fairly determined cost.

"It is my belief that if it is found that the seller has been selling below cost, or that he has orders on hand and quotations out on a non-profit basis at fair volume, his banker or his vendor is very likely to take the position that he cannot in the near future sell at a profit and therefore is not a good credit risk.

"Many buyers who are knowingly buying below cost

are watchfully waiting for the time when the seller will try to make up the losses and it will be hard indeed for the seller to do so.

"It is my thought that, if the outcome of cut-price operations is to make it difficult to obtain capital to reinforce that which has been used to buy business, much will be gained.

"I believe it would have a most helpful effect in bringing back sane, hard-working, but constructive competition, and would make those few industries, not now in the throes of a dog-eat-dog battle, extremely hesitant about initiation of the flagrant "dumper" and the establishment of both producers and bankers.

"It might be pointed out that those manufacturers who have maintained sound and sane price policies through superior management and selling are entitled to real consideration by their bankers and by their vendors as customers who are assets to the community and the industry."

Difficulties, of course, will appear to the reader in connection with this suggestion. One of them is the fact that present overheads cannot in many cases be absorbed into cost and give a feasible selling price. Another is the difficulty with which the banker could determine a fair price in an individual case. However, any plan looking toward such a desirable combination of results as the elimination of the flagrant "dumper" and the establishment of a new credit criterion is worth thinking about.

## World Pig Iron Production

PIG IRON production for many years was considered a barometer of the course of the steel industry and of business in general. Whether it still may be so regarded is denied by some. However, fluctuations in output are carefully watched, often with beneficial results.

Preliminary estimates of the world production of pig iron for 1932 afford the basis for interesting observations. World output is placed at approximately 38,450,000 gross tons. Comparisons with the last three years show that the 1932 decline from 1931 has been about 30 per cent, from 1930 about 51.5 per cent and from 1929 about 60.5 per cent. These data indicate in some measure the world-wide extent of the depression.

Even more interesting is the decline in the rate of production in the United States. The estimated output of pig iron for 1932 in this country is placed at about 8,500,000 tons. This is a decrease of about 54 per cent from 1931, of 73 per cent from 1930 and of 80 per cent from 1929. The greater severity of the effect of the depression in the United States than in the world as a whole may be deduced from the contrasts thus afforded. The American decline this year from 1931 is 54 per cent as against only 30 per cent for the world. From the peak record in 1929 the American decline is 80 per cent with that of the world 60.5 per cent.

# PERSONALS

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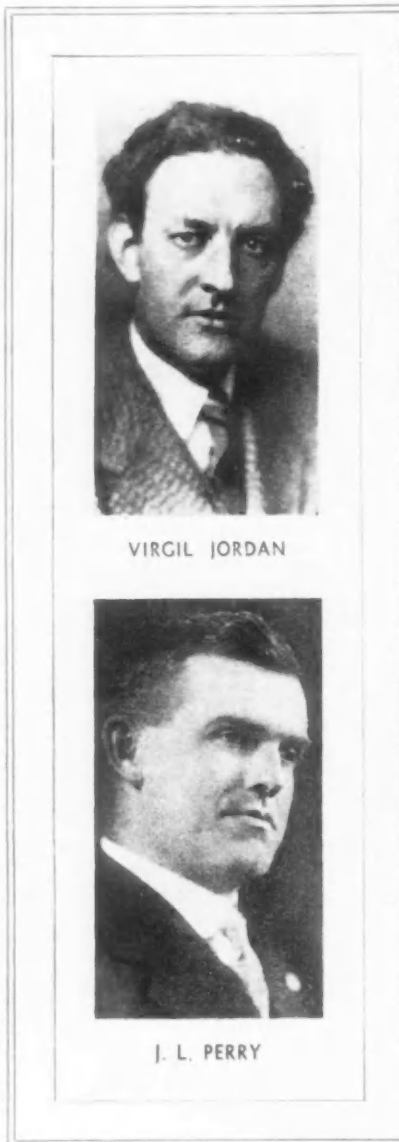
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# Iron and Steel Exports in 1932 Reached Their Lowest Total

Imports Relatively Heavier Than Outgoing Shipments—  
Both Exports and Imports Gained in November

WASHINGTON, Dec. 27 — American exports of iron and steel products in 1932 reached their lowest total at an estimated movement of only 585,600 gross tons. This compares with 965,268 tons in 1931, also an exceptionally poor year. The first 11 months of 1932 saw but 540,573 tons of exports and, of this quantity, 197,347 tons or 36 per cent was scrap. Exports in November, 1932, rose to 56,041 tons from 41,226 tons in October. The gain of 14,815 tons having been more than

accounted for by scrap exports, there were losses in rolled steel lines.

Imports held up much better relatively than did exports. Incoming shipments for 1932 are estimated at 380,610 tons. In the first 11 months of 1932 they were 348,892 tons against 395,277 tons in the corresponding period of 1931. Of the incoming shipments in the first 11 months of 1932, pig iron accounted for 116,386 tons. Some finished products were imported in greater volume than they were exported. Imports in November, 1932,

were 34,924 tons against 33,693 tons in October.

Exports of scrap in November were 29,184 tons or 52 per cent of the total movement, leaving but 26,857 tons of other products that went to foreign markets. The principal shipments of scrap consisted of 16,297 tons, which went to Canada, and 12,372 tons, which went to Japan. Among other exports by countries of consumption were: Canada: steel bars, 558 tons; skelp, 4068 tons; black steel sheets, 1798 tons; plain structural material, 596 tons. Philippine Islands: galvanized sheets, 922 tons; plain structural material, 251 tons. China: tin plate, 1690 tons. Cuba: galvanized sheets, 232 tons.

Belgium supplied all of the 1474 tons of concrete reinforcement bars imported in November, 2087 tons of the 3150 tons of incoming merchant steel bars and 992 tons of the 2741 tons of hoops and bands received. Imports from Germany included 665 tons of merchant steel bars, 309 tons of wire rods and 696 tons of hoops and bands. Among imports from France were 280 tons of merchant steel bars and 1000 tons of hoops and bands. Sweden and the United Kingdom supplied 298 and 287 tons respectively of wire rods. Netherlands was the principal source of pig iron imports in November, as has been the case throughout the year, furnishing 6485 tons of the total of 8776 tons imported. Of the 3326 tons of ferromanganese imported, 2757 tons came from Canada, 235 tons from Norway and 234 tons from the United Kingdom. All of the 1337 tons of manganese ore imported came from the Gold Coast of West Africa.

Belgium led as the source of imports in November and in the 11 months ended November, 1932, furnishing 9937 and 87,742 tons respectively.

## United States Imports of Pig Iron by Countries of Origin

	(In Gross Tons)		Eleven Months Ended November	
	November		November	
	1932	1931	1932	1931
India .....	984	7,148	27,235	65,938
United Kingdom .....	1,075	50	17,517	2,656
Germany .....	36	....	361	202
France .....	....	....	....	25
Netherlands .....	6,485	333	67,733	6,902
Sweden .....	....	....	447	3,401
Norway .....	36	....	138	225
Canada .....	101	1,274	2,113	2,608
Belgium .....	....	....	200	300
All others .....	59	....	642	1,158
Total .....	8,776	8,805	116,386	83,415

## Imports of Iron and Steel Products into the United States

	(In Gross Tons)		Eleven Months Ended November	
	November		November	
	1932	1931	1932	1931
Pig iron.....	8,776	8,805	116,386	83,415
Sponge iron.....	5	....	163	210
Ferromanganese* .....	3,326	3,770	22,111	25,885
Ferrosilicon† .....	18	....	175	96
Other ferroalloys .....	....	46	48	689
Scrap .....	87	933	673	1,675
Pig iron, ferroalloys and scrap.....	12,212	13,654	9,775	15,938
Steel ingots, blooms, billets, etc....	94	1,866	2,309	17,627
Wire rods.....	935	624	6,785	6,452
Semi-finished steel.....	1,029	2,490	9,094	24,079
Concrete reinforcement bars.....	1,474	1,597	26,272	36,798
Hollow steel bars.....	403	31	826	1,425
Merchant steel bars.....	3,150	2,950	28,900	45,500
Iron bars.....	9	46	436	780
Iron slabs.....	7	....	18	40
Boiler and other plate.....	10	1	418	732
Sheets, skelp and saw plate.....	3,693	274	20,568	15,918
Tin plate.....	21	30	7,246	179
Structural shapes.....	5,655	3,703	32,379	65,762
Sheet piling.....	....	....	1	919
Rails and rail fastenings.....	383	82	5,418	4,724
Welded pipe.....	434	1,098	4,097	7,364
Other pipe.....	89	1,109	2,352	7,861
Barbed wire.....	1,876	2,072	14,020	8,939
Round iron and steel wire.....	102	202	1,778	2,435
Flat wire and strip steel.....	131	39	1,399	625
Wire rope and strand.....	148	152	1,669	1,783
Other wire.....	243	23	1,089	505
Hoops and bands.....	2,741	4,374	30,203	23,742
Nails, tacks and staples.....	1,199	369	9,808	7,772
Bolts, nuts and rivets.....	33	92	222	915
Other finished steel.....	24	6	150	239
Rolled and finished steel.....	21,525	18,244	189,269	234,957
Cast iron pipe and fittings.....	50	145	251	6,621
Castings and forgings.....	108	101	947	1,712
Total .....	34,924	34,634	348,892	395,277

\*Manganese content only.

†Chromium content only.

‡Silicon content only.

## Trade Notes

**Stainless Clad Steel.**—Ingersoll Steel & Disc Co., division of Borg-Warner Corp., 310 South Michigan Avenue, Chicago. Folder describing the composition, method of manufacture and fabrication of Ingersoll stainless clad steel. Applications of this new corrosion resisting material are illustrated.

**L. R. Flori Co.**, 2626 North Broadway, St. Louis, incorporated for \$15,000 to recondition and fabricate piping, has been appointed exclusive distributor in the Southwest and Mid-Continent territory by Allegheny Steel Co., Breckenridge, Pa. A branch office has been opened at Tulsa to serve the oil field trade.

**Detroit Seamless Steel Tubes Co.** has moved its Chicago district sales offices to 1768 First National Bank Building. L. R. Phillips is district sales manager.

Circuit Judge Hall at St. Louis has authorized the trustees of the \$4,000,000 estate of the late John Scullin to lend \$300,000 to the Scullin Steel Co. of that city. The decision was in the suit of the Mercantile-Commerce Bank & Trust Co., one of the three trustees, to determine whether the trustees could make the loan legally.



## SUMMARY OF THE WEEK'S BUSINESS

# Steel Industry Ends Year With Production at 13 Per Cent

Ingot Rate Declines Slightly From Last Week's—Chief Sustaining Factors Are Automobile Steel and Tin Plate Rollings

THE steel industry is ending a disastrous year with better production than was expected. Although some rolling mills are shut down for the entire holiday period, the steel-making rate has declined only to 13 per cent of the country's capacity from 14 per cent last week, and is slightly above the low point of the depression, reached in the holiday week last July. Raw steel output is sustained chiefly by the automobile industry's requirements and advance rollings of tin plate.

In districts where automobile steels are the principal products there has been no suspension except that occasioned by the week-end holidays. A Detroit steel plant is running five of its six open-hearth furnaces, one being idle for repairs, and at Cleveland the current rate is 26 per cent, the same as last week. The Pittsburgh district, however, is not above 12 per cent, while production in the Valleys has declined to about 10 per cent. The eastern Pennsylvania district is also down to about 10 per cent. Chicago district output has not gained from its extremely low point of last week, but orders there have increased moderately, indicating a somewhat better operation in the first week of January.

STEEL mills will start out the new year with no important backlog tonnages and with very indefinite prospects, but there is naturally an expectation that business will improve moderately after the year-end pause. A few orders have filtered in for January shipment and billing. At Chicago there was a sudden spurt in orders from the railroads for track supplies that are needed immediately, recent cold weather and snow having made track repairs necessary. In no other particular, however, has railroad buying shown signs of betterment, although the settlement of the wage controversy with the unions removes one of the obstacles to the carrying out of 1933 maintenance and equipment programs, restricted though they may be. Another objective of the carriers is the continuance of emergency freight surcharges after March 31. Hearings on this subject are to be begun this week.

An increase in automobile output in January over the 110,000 cars estimated as this month's output is now fairly certain. Ford's schedule for next month is said to be 20,000. Chevrolet's production, which is the largest in the industry, will be expanded somewhat next month because the schedule of assemblies set for December has not been quite attained. Ford's recent

orders for sheets have given work to some mills that would otherwise have little to do. One bar mill unit worked through the Christmas holidays to rush shipments to an automobile manufacturer. Further steel purchases by some of the automobile companies will be made within a week or two, as schedules of production have been set for the next six weeks.

Tin plate contracting, usually an important feature of steel trade at this time of year, is still backward, though a few large contracts have been closed. Some belated specifications for January shipment have been received. Tin plate mills are operating this week at 25 to 30 per cent, with betterment next month reasonably certain.

Building construction, as represented by structural steel lettings of only 11,250 tons, with inquiries for 3900 tons, is seasonally dull. Normally the trend of structural steel awards is upward in the early months of a year, but the outlook for 1933 is dimmed by the dearth of private construction and uncertainty with respect to Federal projects under economy influences at Washington. The formal contract for 60,000 tons of steel for the bridge to be built over the Mississippi River at New Orleans probably will be placed this week.

THE year ends with virtually no further price changes on finished steel, pig iron or scrap. Foundry coke has eased off 25c. a ton. Although open market quotations on finished steel are unchanged, signs of weakness are cropping up here and there. Reinforcing bars have been sold at mill quotations ranging from 1.30c. to 1.40c., Cleveland, for use in that city. Full finished sheets have been sold at concessions, and prices on galvanized material have been shaded in the South and Southwest. The \$2 a ton advance on No. 24 gage annealed sheets, scheduled to go into effect on first quarter contracts, has not been established, as consumers are apparently of the opinion that higher prices cannot be put into effect at this time, and hence they are delaying in making commitments. Competition for structural steel business in Chicago has brought quotations on fabricated material almost to the level of the open market prices on shapes, while in the East the plate market is still subject to wide variations in prices.

THE IRON AGE composite prices are unchanged at 1.948c. a lb. for finished steel, \$13.56 a gross ton for pig iron and \$6.92 a gross ton for heavy melting scrap.

# ▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month and One Year Previous  
Advances Over Past Week in Heavy Type, Declines in Italics

## Pig Iron

	Dec. 27, 1932	Dec. 20, 1932	Nov. 29, 1932	Dec. 29, 1931
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia.....	\$13.34	\$13.34	\$13.59	\$15.51
No. 2, Valley furnace.....	14.50	14.50	14.50	15.50
No. 2 Southern, Cin'ti.....	13.82	13.82	13.82	14.69
No. 2, Birmingham.....	11.00	11.00	11.00	12.00
No. 2 foundry, Chicago*.....	15.50	15.50	15.50	16.50
Basic, del'd eastern Pa.....	13.50	13.50	13.50	16.25
Basic, Valley furnace.....	13.50	13.50	13.50	15.00
Valley Bessemer, del'd P'gh..	16.89	16.89	16.89	17.76
Malleable, Chicago*.....	15.50	15.50	15.50	16.50
Malleable, Valley.....	14.50	14.50	14.50	16.00
L. S. charcoal, Chicago.....	23.17	23.17	23.17	23.04
Ferromanganese, seab'd car-lots	68.00	68.00	68.00	75.00

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

## Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$40.00	\$40.00	\$40.00	\$43.00
Light rails at mill.....	30.00	30.00	30.00	34.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	28.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	28.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	28.00
Forging billets, Pittsburgh...	31.00	31.00	31.00	35.00
Wire rods, Pittsburgh.....	37.00	37.00	37.00	37.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.60	1.50

## Finished Steel

<i>Per Lb. to Large Buyers:</i>				
Bars, Pittsburgh.....	1.60	1.60	1.60	1.50
Bars, Chicago.....	1.70	1.79	1.70	1.60
Bars, Cleveland.....	1.65	1.65	1.65	1.55
Bars, New York.....	1.95	1.95	1.95	1.83
Tank plates, Pittsburgh.....	1.60	1.60	1.60	1.50
Tank plates, Chicago.....	1.70	1.70	1.70	1.60
Tank plates, New York.....	1.898	1.898	1.898	1.78
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.50
Structural shapes, Chicago...	1.70	1.70	1.70	1.60
Structural shapes, New York	1.86775	1.86775	1.86775	1.75 1/4
Cold-finished bars, Pittsburgh	1.70	1.70	1.70	2.00
Hot-rolled strips, Pittsburgh..	1.45	1.45	1.45	1.45
Cold-rolled strips, Pittsburgh.	2.00	2.00	2.00	2.00

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

## Finished Steel

	Dec. 27, 1932	Dec. 20, 1932	Nov. 29, 1932	Dec. 29, 1931
<i>Per Lb. to Large Buyers:</i>				
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.10	2.10	2.10	2.25
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.20	2.20	2.20	2.35
Sheets, galv., No. 24, P'gh...	2.85	2.85	2.85	2.80
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.90
Hot-rolled sheets, No. 10, P'gh	1.55	1.55	1.55	1.60
Hot-rolled sheets, No. 10, Chicago dist. mill.....	1.65	1.65	1.65	1.70
Wire nails, Pittsburgh.....	1.95	1.95	1.95	1.95
Wire nails, Chicago dist. mill.	2.00	2.00	2.00	2.00
Plain wire, Pittsburgh.....	2.20	2.20	2.20	2.20
Plain wire, Chicago dist. mill.	2.25	2.25	2.25	2.25
Barbed wire, galv., P'gh.....	2.60	2.60	2.60	2.60
Barbed wire, galv., Chicago dist. mill.....	2.65	2.65	2.65	2.65
Tin plate, 100 lb. box, P'gh...	\$4.25	\$4.25	\$4.25	\$4.75

## Old Material

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh....	\$8.75	\$8.75	\$9.00	\$10.25
Heavy melting steel, Phila...	6.75	6.75	7.25	7.50
Heavy melting steel, Ch'go...	5.25	5.25	5.87 1/2	7.75
Carwheels, Chicago.....	7.00	7.00	7.00	8.50
Carwheels, Philadelphia.....	8.00	8.50	9.25	11.50
No. 1 cast, Pittsburgh.....	9.50	9.50	9.50	10.00
No. 1 cast, Philadelphia.....	8.00	8.00	8.00	10.00
No. 1 cast, Ch'go (net ton)...	6.25	6.25	6.25	8.50
No. 1 RR. wrot., Phila.....	7.50	7.50	7.50	9.50
No. 1 RR. wrot., Ch'go (net)...	4.00	4.00	4.50	6.50

## Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$1.75	\$1.75	\$1.75	\$2.25
Foundry coke, prompt.....	2.50	2.75	2.75	3.50

## Metals

<i>Per Lb. to Large Buyers:</i>				
Lake copper, New York.....	5.00	5.00	5.25	7.37 1/2
Electrolytic copper, refinery.	4.75	4.75	5.00	7.00
Tin (Straits), New York....	22.80	22.90	22.10	21.80
Zinc, East St. Louis.....	3.12 1/2	3.12 1/2	3.15	3.15
Zinc, New York.....	3.49 1/2	3.49 1/2	3.52	3.50
Lead, St. Louis.....	2.87 1/2	2.87 1/2	2.90	3.55
Lead, New York.....	3.00	3.00	3.00	3.75
Antimony (Asiatic), N. Y....	5.40	5.40	5.75	6.15

# ▲▲▲ The Iron Age Composite Prices ▲▲▲

## Finished Steel

Dec. 27, 1932  
One week ago  
One month ago  
One year ago

1.948c. a Lb.  
1.948c.  
1.948c.  
1.945c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot rolled strip. These products make 85 per cent of the United States output.

	High	Low
1932 .....	1.977c., Oct. 4;	1.926c., Feb. 2
1931 .....	2.037c., Jan. 13;	1.945c., Dec. 29
1930 .....	2.273c., Jan. 7;	2.018c., Dec. 9
1929 .....	2.317c., April 2;	2.273c., Oct. 29
1928 .....	2.286c., Dec. 11;	2.217c., July 17
1927 .....	2.402c., Jan. 4;	2.212c., Nov. 1

## Pig Iron

\$13.56 a Gross Ton  
13.56  
13.59  
14.79

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High	Low
\$14.81, Jan. 5;	\$13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

## Steel Scrap

\$6.92 a Gross Ton  
6.92  
7.37  
8.50

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low
\$8.50, Jan. 12;	\$6.42, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 9	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 22	

# Pittsburgh Steel Production Dips to 12 Per Cent of Capacity

▲▲▲

**P**ITTSBURGH, Dec. 27.—While orders for finished steel products have been very light in the past week, tonnage has not entirely ceased to come in, and steel production in this and nearby districts has not declined as much as had been expected. Continued releases from the automotive industry have helped the situation considerably.

Structural awards are light, and small tonnages are generally involved. Formal placing of the contract for the New Orleans bridge over the Mississippi River, requiring 60,000 tons of structural shapes, is scheduled for this week.

Tin plate releases are still small, but continued rolling of anticipated tonnage has prevented production from dropping off sharply.

Steel ingot production in the Pittsburgh district averages about 12 per cent of capacity this week, if the Monday holiday is taken into account. A number of plants which suspended production over the week-end have resumed again at the rate which prevailed before. The Youngstown district averages about 10 per cent, output of steel being maintained largely by the requirements of tin mills, and recent releases for sheets and strip steel.

Steel prices are quotably unchanged, but tend toward weakness on some products. In the immediate Pittsburgh territory shading is not frequently encountered, but competition in outside-districts has developed some low prices if freights are figured back here.

No scrap purchases by mills are reported, but a nonintegrated steel company has purchased several hundred tons of basic iron from an Ohio River producer. Foundry coke is quotably lower.

## Pig Iron

Foundry operations in the district have practically ceased and there is scarcely any movement of iron. Some consumers have already scheduled shipments for the first week of the new year when production will be resumed. Forward buying is lacking, and no test of the current price structure is available.

The Edgewater Steel Co., Oakmont, Pa., has purchased several thousand tons of basic iron from an Ohio River steel producer.

## Semi-Finished Steel

Shipments have been small in the last week or two and inventories of

ingot production drops to 12 per cent in Pittsburgh district and to 10 per cent in Valleys.

\* \* \*

Continued releases from automotive industry have prevented further slump.

\* \* \*

Advance rollings of tin plate also aid holiday week operations.

▼▼▼

users of billets, slabs and sheet bars are very light. Contracts have been extended into the first quarter at the prevailing price of \$26, Pittsburgh or Youngstown. Forging billets are well maintained at \$31, Pittsburgh, and no deviations from the \$37 price on wire rods are reported.

## Rails and Track Accessories

Few of the carriers have closed against their first quarter inquiries for track supplies, and the Atlantic Coast Line has postponed the opening of bids on 5000 kegs of spikes until Jan. 5. The Boston & Maine is in the market for 6000 to 8000 kegs of spikes. A few roads have completed their 1933 budgets, and settlement of the wage rate for next six months may help to focus attention on their forward needs.

## Bars, Plates and Shapes

Scarcely any buying has been done in the last week, but producers look for improved volume in January. Structural awards are light, but a fair amount of inquiry which is before the trade will be closed in January. The same can be said for reinforcing bars, although this market is more subject to seasonal influences. Plates are very quiet, but a few inquiries from the railroads are still to be closed and prospects in barge building are rather hopeful. Fabricators of oil tanks are taking a little business. Movement of bars to the automotive industry is naturally light.

Prices are holding fairly well in this district, with reinforcing bars presenting the only marked tendency toward weakness. Distributors continue to quote 1.60c., Pittsburgh. Plates are subject to extreme shading in the East, but the market in the immediate Pittsburgh territory is satisfactorily maintained at 1.60c. On structural material, low mill prices would seem to be reflected in the quotations of fabricators, but concessions of more than \$2 from the 1.60c., Pittsburgh, price are difficult to pin down. Merchant bars are hold-

ing well, and alloy steel bars are still quotable at a range of 2.45c. to 2.65c., Pittsburgh, the lower figure representing the price to large buyers in the automotive field.

## Cold-Finished Steel Bars

Smaller users are now generally covered for their first quarter needs and large buyers are falling into line. Current specifications are very light, but the month's shipments have not declined as much as might be expected in December. The base price of 1.70c., Pittsburgh, is well maintained.

## Tubular Goods

The pipe market is subject to the usual year-end dullness, and mills are generally idle this week. Movement of oil country goods has helped to maintain production this month, but activity has temporarily ceased in this department. Butt weld pipe is finding scarcely any demand but distributors' stocks are low and some replenishment orders may be expected in January. Discounts are being fairly well maintained, with the base figure applying to carload lots, while jobbers are given an extra 5 per cent.

## Wire Products

This market is very quiet, with jobbers postponing purchases until January and manufacturing consumers generally closed down for the holidays. The automobile industry is still taking certain specialties. Prices are holding on the general run of business in this district, but nails and other merchant products are subject to occasional shading in Southern territory.

## Sheets

The placing of a fair-sized order by the Ford Motor Co. has enabled a few mills to maintain production at a high rate during the holiday season, but Detroit and northern Ohio producers were affected principally. Otherwise, scarcely any tonnage has come in during the last week, and production in this district is well under 10 per cent of capacity. The industry as a whole is doing somewhat better. First quarter contracting has been slow and efforts to raise prices to some buyers are not meeting with success. Galvanized sheets are subject to price concessions in the South, but are well maintained in this district at 2.85c., Pittsburgh. Other prices are unchanged.

## Tin Plate

Mill schedules have not declined as much as had been expected this week,



as suspension in some plants has been offset by renewed operations at others. The average rate ranges from 25 to 30 per cent of capacity, with the promise of improvement early in January. Specifications continue light and contracting for 1933 is proceeding slowly.

#### Strip Steel

Most of the strip mills in the district are inactive this week, and few orders for January shipment are coming in. Forward contracting is being carried on listlessly, but the prices seem to be well held on the general run of business. Hot-rolled strip is quoted at 1.45c., Pittsburgh, and cold-rolled at 2c., Pittsburgh or Cleveland.

#### Coal and Coke

Warmer weather has resulted in decreased demand for domestic coal and coke, and the market is otherwise very quiet. No movement of furnace coke is reported and foundries are taking in no shipments this week. The furnace grade is quoted at \$1.75, Connellsville with occasional cars bringing a higher figure. Foundry prices are weak and \$2.75, Connellsville, is shaded in many cases, \$2.50 being more representative of the market minimum.

#### Scrap

Scarcely any consumer purchases have been made in the last week, and no action is expected until after the beginning of the new year. Dealers are not pushing sales at the expense of price, and any distress material coming out is quickly absorbed. In fact, some grades of scrap can scarcely be shipped to this district at the present low price levels, and stocks in the hands of consumers are not large enough to draw on heavily for current needs. Prices continue unchanged.

### Detroit Scrap Market Quiet; Prices Nominal

DETROIT, Dec. 27.—The present lull in the local scrap market reflects the influence of the holiday season. With only meager buying by consumers expected until some time in January, prices are nominal.

A guide, designed as a convenient and quick source from which suitable nickel and nickel-chromium cast iron compositions may be selected for specification purposes, has been prepared and distributed by the International Nickel Co., Inc., New York. This is the first of a series of data sheets covering composition and service data on industrial applications of nickel cast iron. The object in the first data sheet is to aid the engineer or designer in selecting, for specification purposes, a composition which will produce a suitable combination of physical characteristics in a casting of a given thickness of section.

### Birmingham Market Ends Year in Extreme Dullness

BIRMINGHAM, Dec. 27.—This month has fully followed early expectations as to the reduction in pig iron consumption, for it has been one of the poorest months that Birmingham pig iron has had in a quarter of a century. Foundry operations have been further reduced, and now the holiday season brings them almost to a standstill. Most foundries have tried to go through the month with as little buying as possible, clearing up all possible yard stocks in anticipation of the year-end inventory.

Blast furnace activities did not change last week, as expected, the Tennessee company waiting until the week-end to bank its furnace. It will probably resume on Tuesday or Wednesday. Instead of banking its furnace, the Republic Steel Corp. changed from foundry to basic and has now set Dec. 31 as the date for banking, which will last from 60 to 90 days, according to present plans. Aside from the week-end stoppage, three furnaces were in blast last week and the same number will work through this week, two being on basic iron and one on foundry.

The price of \$11 for the Southern market has not been changed.

#### Steel

Bookings are small and for routine requirements. One steel company during the first three weeks was slightly ahead of the same period in November. New business of the fabricators is also small. Last week five open-hearths were operated, and the same number is scheduled this week. The scheduled reduction for last week was delayed. Prices are unchanged.

### Pacific Coast Projects Near Contracting Stage

SAN FRANCISCO, Dec. 24.—Although very little steel tonnage has been placed on the Pacific Coast just prior to the holidays, considerable interest has been created by calls for bids on several projects that have been pending for several months.

At Seattle, bids will be taken on Jan. 11 on the Railway Avenue seawall, involving 1678 tons of bars, 5690 tons of steel piling and 850 tons of cast iron pipe. The alternative bids of wood, steel, concrete and cast iron pipe for the Seventeenth Avenue North East pipe line in Seattle have been taken under advisement. At San Francisco, bids have been tentatively called for by Feb. 28 on contract No. 2 of the San Francisco-Oakland bridge, involving 150 tons of structural steel and 1900 tons of reinforcing bars. With the contract signed with the Reconstruction Finance Corporation for a \$62,000,000 loan, it is expected that bids will be called on other units of

the bridge in the near future. Bids have been requested by Dec. 28 at San Francisco for the Psychopathic Ward, involving 735 tons of structural steel. Specifications have been issued for an addition on the Headquarters building at Fort Mason, Cal., requiring 1500 tons of reinforcing bars, and bids have been called for by Jan. 17.

Within the next six weeks contracts should be placed on projects now in view requiring approximately 14,000 tons of reinforcing bars. The contracts at Fort Miley, Fort Mason, the Hoover Dam, the San Francisco-Oakland and Golden Gate bridges and the Pine Canyon dam at Pasadena require the largest steel tonnages in this total, which is exclusive of other contracts on the San Francisco-Oakland Bridge other than contract No. 2. There is approximately 18,000 tons of structural steel pending that should be placed within this time, the Golden Gate Bridge and the Railway Avenue seawall requiring the largest tonnages.

### Cincinnati Trade Has Sold Little First Quarter Iron

CINCINNATI, Dec. 27.—The pig iron market is apathetic. Interest in first-quarter needs is small. In fact, the second purchase for next year was reported the past week when a southern Ohio melter bought 1000 tons of Northern foundry iron. Half of this purchase was closed through a Cincinnati office and the remainder through a northern Ohio office. Other business the past week did not exceed 300 tons. Except for some activity among automotive foundries, the melt has changed very little.

#### Steel

Automotive buying of sheets is small, but constant. Other purchases are spotty and reveal no trend. A few sheet users have contracted into the first quarter, but no general movement to care for future requirements is discernible.

#### Scrap

Extreme dullness pervades the district scrap market. Purchases are small and reveal mill pressure on prices.

Gray Iron Institute will hold a general meeting at the Congress Hotel, Chicago, Jan. 26, to which all gray iron foundrymen are invited. A number of new developments affecting the industry will be discussed. A portion of the program will be devoted to marketing problems.

A contract amounting to nearly \$110,000 for three 5000-kva. synchronous condensers and insulators has been awarded the Westinghouse Electric & Mfg. Co. by the Metropolitan Water District of Southern California. The equipment will be installed on a temporary power line running from Los Angeles to the Colorado River at Parker Dam.

# Chicago Steel Sales Grow Moderately; Some Releases for Shipment Next Week

CHICAGO, Dec. 27.—Although rolling schedules are lighter than a week ago, mills in general have heavier commitments for immediate shipment than had been anticipated for the end of the year. Sales and specifications of finished steel products, both strongly influenced by the needs of automobile manufacturers, have grown moderately. Although the rail market is dull, there has come a sudden spurt in demand for track supplies that are needed immediately. Order mails now contain some releases for shipment after Jan. 1, a turn in affairs that has been anxiously awaited by the trade.

A number of cross-currents are apparent in the structural steel market. There is greater disposition on the part of producers to hold in this territory business that originates here. Every shop is in need of work, and competition is keener than at any time this year. The result is that prices quoted by fabricators at times approach perilously near to the open quotations on plain material. General contractors are shopping closely and jobs often hang fire for weeks while low prices are sought from fabricators.

A 4000-ton plate project is pending at Denver, Col., where a steel pipe line is to be constructed.

## Pig Iron

Shipments are holding and the prospects are excellent that they will grow in January. Releases for shipment next month have suddenly started to reach sellers and the tide has turned sufficiently to warrant sellers to expect that January shipments may reach the volume of last October. Only one Chicago merchant stack is blowing. The blast furnace at Toledo was blown out Dec. 21.

## Bolts, Nuts and Rivets

Producers are working on an average of three days this week, which is a rate higher than they had anticipated. Specifications remain light.

## Reinforcing Bars

Dealer interest is centered on 2500 tons of road and bridge work for which bids were opened Dec. 23 at Springfield, Ill. Successful contractors will proceed with bridge construction, but slab work must await favorable spring weather. Inquiries of size are still absent, and the character of sales is such that no real test of prices is to be had. Shipments of

Chicago mills are ending the year better than had been expected, sales and specifications having expanded slightly.

Pig iron shipments next month also promise to increase.

Structural steel market disturbed as fabricators' prices drop very nearly to open market quotations on plain material.

reinforcing bars are limited to scattered small lots and a few State bridge jobs.

## Warehouse Business

Discounts on machine bolts, common carriage bolts, coach and lag screws and hot-pressed nuts, both square and hexagon, have been reduced five points to 65 per cent off list. Sales from warehouses continue to drop, though the downward swing is not as sharp as it has been in some previous years.

## Cast Iron Pipe

Prospect of an inquiry of size rests with the city of Chicago which is preparing to accept Government funds for the construction of a new water pumping plant to replace three old plants. Less-than-carload orders have shrunk to the point where shipments of cast iron pipe are the lowest in many years. Most pipe foundries are idle for the remainder of the year.

## Structural Material

There is still hope that the Randall Tower will be erected. This project will take 15,000 tons rather than the much larger figure heretofore stated. A characteristic of this market is that fabricated steel prices in some instances barely cover the open market prices of plain material.

## Bars

This market is getting most of its support from automobile manufacturers, and that industry promises to do better in January. The impression is growing here that small miscellaneous users of bars will play an increasing part in business placed in the early part of the new year.

## Rails and Track Supplies

The rail market is dull, but track accessories have suddenly come to life

and new orders are the best in six weeks. Deliveries are to be made immediately. This reflects the urgent need for supplies.

## Plates

A few small but indefinite inquiries for tanks are in the market from breweries. Current cuts in oil production indicate that new storage capacity will not be needed in the near future. A tank car operator is taking figures on a few heads.

## Sheets

Hot mills are again forced to await accumulations of orders and will not start to produce before the middle of the week. Some business is available from automobile plants, while farm machinery manufacturers are releasing about 10 per cent of normal requirements. Specifications from warehouses are very light. Many of them are overstocked, as gaged by current business, and they are liquidating part of the material on hand.

## Cold-Rolled Strips

Specifications from automobile manufacturers are gaining slowly and the cold-rolled strip industry is now operating at about 15 per cent of capacity.

## Wire Products

This market is drifting under the influence of the holiday season and the inventory period. Jobbers are either engaged in taking stock or, having completed the job, are standing by waiting for the new year before ordering in more material. Forward buying is disappointingly small and some sellers are venturing the prediction that because of this lack of interest the first quarter of 1933 will show less activity than the first three months of the present year. Specifications are steady from the automobile group.

## Scrap

A steel mill has again come into the market for a small lot of heavy melting steel, paying \$5.50 a gross ton, delivered. Another consumer has taken some cast iron borings at \$3.50 a ton. Production of borings is very light but it balances well with users' requirements. Demand for hydraulic bundles is dull and, because of low prices and the cost of bundling, only small lots are offered in the market. Unprepared scrap is still moving slowly to local docks, where piles are growing because outlets to consumers are closed. Railroads still hesitate to sell scrap because of low prices.

# Eastern Pennsylvania Steel Operations at 10 Per Cent

Trade Marking Time as Year-End Dullness Has Further Effect on Orders and Output

**P**HILADELPHIA, Dec. 27.—The iron and steel trade in eastern Pennsylvania is marking time as 1932 comes to a close and hoping for an upswing in the new year. There is, however, no expectation that a substantial increase is in sight in the immediate future. Generally the view is taken that any forecast as to what lies ahead is not possible until about the second week in January. By then the aftermath of the holiday and inventory seasons will have been surveyed, and consumers will be in a better position to appraise their own position.

Some steel interests are awaiting such a possible determination of the outlook and consequently have further deferred plans of resuming steel works operations. At least one interest has decided not to relight open-hearth capacity until about Jan. 10. The company had planned to resume Jan. 1. But incoming business has been so light that present ingot stocks will carry through to Jan. 10 for mill operations. Some steel works have not changed their rate of operations, while a number of open-hearth furnaces have been closed down, most of them until or shortly after New Year's Day. The rate of operations, as a result, is down three or four points to 9 or 10 per cent of capacity.

Prices in some lines are showing further irregularity, especially in plates, on which sharp concessions are said to be taking place. Shapes and merchant bars are in a somewhat, though not a great deal better position. Shading of automotive sheet prices is reported to have become more widespread also.

## Pig Iron

Except for a sale of 1000 tons of foundry iron at \$12.50, furnace, to a nearby consumer, the market for pig iron has been extremely inactive the past week. Hardly any sales or inquiries have been made. Occasionally bookings are taken and inquiries made for carloads. A feature of the little business that is going is the requirement for quick delivery. This is taken to reflect the absence of stocks in the hands of melters. One domestic maker reports having closed a contract for a light tonnage of ferromanganese for first half delivery at \$68, furnace. The carryover on the books of blast furnaces for delivery in the new year is almost negligible.

## Plates, Shapes and Bars

Irregularity in the price of plates has become more marked with sharp

concessions made below the published quotation of 1.60c., Pittsburgh. Merchant bars and structural shapes are reported to be in a somewhat stronger position than plates, though shading in these lines has become more general. The Reading Railroad is expected to approve its January budget for material to complete its program for the repair of 3000 cars. It is said this carrier still has about 1000 tons of material to buy. The Anchor Post Fence Co., Baltimore, has put out an inquiry for 4000 tons of 7/16-in. x 9/16-in. deformed oval bars and 1000 tons of 7/16-in. merchant bars for the manufacture of a mat for the roadway to the Golden Gate bridge being built at San Francisco. The New Jersey State Highway Department will open bids tomorrow for a superstructure of a bridge over the Hackensack River near Rutherford. The superstructure will be for a 185-ft. double leaf bascule span. There will also be three flanking spans of 115 ft. each. The material involved consists of 1815 tons of carbon structural,

360 tons of silicon structural, 190 tons for trunnions and machinery and 150 tons of concrete reinforcement bars. Bids will be opened Jan. 2 for a boat for the Virginia Ferry Corp., calling for 700 tons of plates. The Phoenix Bridge Co. was awarded the steel work, involving 3000 tons, for a viaduct at Newark, N. J., for the New Jersey State Highway Department.

## Sheets

Local automobile body building plants are taking small tonnages for new models. Substantial buying is expected to be made about the middle of next month by the Edward G. Budd Mfg. Co. for Plymouth bodies. Concessions of about \$2 are reported for full-finished sheets. Commercial grades are said to be somewhat irregular but steadier than quotations for automotive sheets.

## Imports

The following iron and steel imports were received here last week: 171 tons of structural shapes, 35 tons of steel bands, 32 tons of flat bars, 10 tons of diamond floor plates and 2 tons of plates from Belgium and 10 tons of pig iron from Sweden.

## Scrap

The market is extremely dull. Mills generally have ample stocks and come into the market infrequently.

## Refrigerating Industry Reached a Peak in 1931

WASHINGTON, Dec. 20.—The mechanical refrigerating industry established a peak production in 1931. The depression notwithstanding, this industry forged ahead and in that year turned out products valued at \$156,211,388, thus knocking 1929 into the discard as its peak when the output was \$150,309,209, according to the Bureau of the Census. The gain of 1931 was 3.9 per cent. In contrast, the 1931 production of ice refrigerators, together with that of cabinets for mechanical refrigerators, exclusive of mechanical equipment, declined to \$36,339,666, a drop of 36.7 per cent from the 1929 production, valued at \$57,433,260.

The annual meeting of the Steel Founders' Society of America will be held at the Statler Hotel, Detroit, Jan. 19, when officers and committees for the ensuing year will be elected. The meeting will take place during the week of the Highway and Building Congress, in which the S.F.S.A. is participating, thus affording delegates an opportunity to see the Road Show and other attractions in connection with that event.

## Buffalo Pig Iron Dull; Low Steel Operation

**B**UFFALO, Dec. 27.—The market for pig iron is very quiet. An occasional car-load transaction is reported, but no sizable commitments have been made.

## Steel

The Lackawanna plant of the Bethlehem Steel Corp. is continuing to operate three open-hearths, and Republic Steel Corp. will continue to operate two open-hearths throughout this week. Wickwire Spencer is operating one open-hearth. The Seneca division of Bethlehem is operating about 20 per cent on sheets. A Buffalo structural steel fabricator has obtained the contract for 150 tons for a State armory at Napanoch, N. Y.

## Scrap

The market is practically devoid of transactions. It is understood that one mill which some months ago purchased No. 2 heavy melting steel at \$6.75 is allowing shipments to come in. Mill operations are very low, and, although some sizable purchasing was expected before Jan. 1, this has not materialized.



# Cleveland Steel Plants Hold to 26 Per Cent Operation

Resume After Holiday Shutdown at Last Week's Schedules—Shipments Principally to Automotive Industry

CLEVELAND, Dec. 27.—Orders for finished steel during the week held to around recent volume, business being affected but little by the holiday period. The automotive industry continues to take the bulk of the tonnage, which is in bars, sheets and hot-rolled strip. A fair volume of business in hot strip is coming from the cold-rolling mills.

All the open-hearth furnaces in operation in Cleveland were shut down three days for Christmas, but resumed today at the schedules that prevailed before the shutdown, or 26 per cent of local ingot capacity.

Demand from consumers outside of the automotive field is slack, being confined to small miscellaneous orders. While railroads are ordering very little steel, some improvement in the demand from this source is expected next month.

Prices generally are steady. Contracting for the first quarter so far has been quite small. Contracts that have been closed have been at the regular quotations. Some consumers are deferring the placing of contracts because they are uncertain of their requirements for the quarter.

## Pig Iron

The market is dull, although some carlot sales are being made for immediate needs. There is virtually no new inquiry. The Dayton, Ohio, melter which recently inquired for 1000 tons of foundry iron for the first quarter, has placed that business, none of which, it is understood, went to Lake furnaces. Shipments to the motor car industry are well maintained, but other consumers are taking very little iron. Recent quotations are being maintained.

## Bars, Plates and Shapes

Bars are moving much better than plates and shapes. New demand for fabricated steel is slack and is reflected in a scarcity of mill orders for plain material. A municipal power plant in Piqua requires 240 tons for extensions. State bridge work requiring 250 tons has been awarded to a general contractor.

Keen competition for reinforcing bar business has resulted in a price concession of \$2 a ton from what has been regarded as the minimum for billet steel bars in large lots. The lower price was given on 1365 tons placed for the Brook Park bridge, Cleveland. The fabricator placed this

order with a Youngstown district mill at reported price of 1.30c, Cleveland. Another lot of 150 tons has gone to a Cleveland mill at 1.40c.

## Sheets

Some additional releases have come from the automotive industry for January requirements, enabling several producers to maintain recent operations. Miscellaneous demand from consumers in other fields is very light. Ohio will take bids Dec. 30 for 1000 tons of automobile license tag stock in either cold-rolled sheets or hot-rolled strip. Few first quarter contracts have been closed. Prices seem to be well maintained.

## Strip Steel

Specifications for hot-rolled strip continue to be fair from manufac-

turers of automobile accessories, and plants in this field directly affiliated with automobile companies are maintaining good schedules. Miscellaneous demand is slack. The market is firm at 1.45c, Pittsburgh. Demand for cold-rolled strip is very light, with prices unchanged at 1.90c to 2c, Cleveland.

## Bolts and Nuts

Demand is confined almost wholly to orders from automobile manufacturers and the railroads. While business from these sources is fair, the December volume from all sources is below that of November. The Ford Motor Co., which makes its own bolts, has made some purchases of nuts. The recently announced revised list on small bolts and new lists on bolts with rolled threads have been generally adopted.

## Scrap

Activity is limited to small shipments against old contracts. Consumers are keeping their stocks low because inventories on Jan. 1 are taxable in Ohio. No new buying is expected before the first of the year. The market is weak, but prices are unchanged. The New York Central Railroad will take bids Jan. 3 on 3000 tons of miscellaneous grades.

## Progress Made Toward Renewal of Cartel

Discussions looking toward the renewal of the European Steel Cartel continue to be held frequently, but as yet no definite agreements for reconstitution have been made, says a report received by the Iron and Steel Division, Department of Commerce. Disagreement among Belgian producers, the main obstacle to the renewal of the cartel, is reported adjusted. There is a vigorous and growing demand for the creation of international sales comptoirs as a condition to the re-establishment of the steel cartel. These comptoirs would be sole selling agents and would subdivide among the different national groups the export trade, leaving to each national group its own domestic market.

## 40-Hr. Week Asked by British Workers

A campaign for a 40-hr. working week, without reduction in pay for men employed in the British engineering industry, was inaugurated at a recent conference at York, England, of representatives of the engineers' trade unions, according to a report to the Commerce Department from Trade Commissioner F. E. Sullivan, London. The present working week is one of 47 hrs.

## British Steel Exports Highest Since April

British exports of iron and steel during October, amounting to 160,430 gross tons, reached the highest level of any month since April and were 33,391 tons above the September volume, according to the Iron and Steel Division of the Department of Commerce.

Imports also registered an increase, totaling 163,190 gross tons in October compared with 107,108 gross tons the month before. The volume of imports was larger during October than that of any month since February and resulted in an unfavorable iron and steel trade balance on a tonnage basis for the first time since that month.

Production during October was also above the September level, it is reported, pig iron output amounting to 275,600 tons and 448,500 tons of steel being turned out.

W. A. Larson Foundry Co., Cleveland, has been organized to operate a foundry in Grafton, Ohio, which it has purchased from the Osborn Mfg. Co., Cleveland. Headquarters of the new company will be in Cleveland. W. O. Larson, foundry manager, Hill Clutch Machine & Foundry Co., Cleveland, is president, R. M. Montis is vice-president and W. A. Dennison is secretary-treasurer.

# Tin Plate Specifications Are Larger in New York District

Business in Other Products Is Marking Time—Post-Inventory Replenishment Buying Awaited

NEW YORK, Dec. 27.—Such activity as there is in the New York district steel market is confined mainly to tin plate and structural steel, particularly material for public works projects, although here and there increased specifications are coming from suppliers of the automobile industry, such as the bolt and nut manufacturers. Tin plate releases have increased materially in the case of some sellers, one of whom reports December specifications twice as large as those of the preceding month. But this gain is due almost entirely to the delay of consumers in ordering. At first they deferred action awaiting the announcement of the 1933 price; then they held off because they were dissatisfied with the new price set-up, especially the narrowing of differentials for large lots. Even yet contracting is slow in getting under way, although some fairly large contract business is reported to have been closed in the past 10 days. The conservative manner in which users are contracting is not due alone to price considerations. Widespread forced sales last spring by bankers who had made loans on hold-over canned goods had a disastrous effect on packers. It now seems likely that this year can companies will be forced to go further in financing packers than in the past.

December bookings on all finished products will probably show little, if any, decline from those of November. Prices are undergoing few real tests because of the paucity of sizable orders, but the plate situation is still unstable and sheets have a weak tone, this being notably true of full-finished material. The trade is making no prophecies regarding January business. The most that can be hoped for is that the completion of inventories will disclose shortages which will result in a fair increase in replenishment buying.

Notable among fabricating steel lettings is the award of 1100 tons to the Jones & Laughlin Steel Corp. for a section of the New York Central track elevation project through the Bell Telephone Laboratories building.

## Pig Iron

Pig iron trading has slackened in keeping with the slow pace of holiday foundry operating schedules. Though a moderate amount of replenishment buying is considered likely after the turn of the year, definite prospects of a sustained demand are still lacking. Current transactions are insignificant.

Bookings in the past week did not exceed 1000 tons, approximating the sales volume in each of the two preceding weeks. Pending business is not more than 200 tons. Lack of tonnage contracting precludes accurate gaging of price schedules. No open breaks are in evidence, however, and base quotations are nominally unchanged.

## Boston Pig Iron and Scrap Markets At Standstill

BOSTON, Dec. 27.—The pig iron market was virtually at a standstill the past week. The usually most active seller booked 50 tons. The General Fire Extinguisher Co., Auburn, R. I., has still to cover on its recent inquiry, but apparently will let the matter go until the new year. There is no other prospective business. The melt of New England is down to about 10 per cent of the rated foundry capacity.

Scrap brokers are doing nothing but kill time. The movement of old material in and out of yards and metal-working plants is inconsequential. Scrap prices are nominal.

The year ends with cast-iron pipe prices considerably higher than in the final days of 1931. On recent business closed, Class B, 8-in. stock was sold at \$35.25 a ton, delivered, 12-in. at \$35.20, and 16 in. at \$35, and even better prices have been obtained for small lots of corresponding sizes.

## St. Louis Foundries are Almost at Standstill

ST. LOUIS, Dec. 27.—Foundry operations in the St. Louis industrial district are almost at a standstill and likely will continue so during the holidays. Neither foundries nor users of castings wish to increase their inventories until after the turn of the year. Prices are unchanged.

## Steel

Barry-Wehmler Machinery Co. reports two unconditional orders from New York brewers for \$60,000 worth of equipment and conditional contracts from other brewers for a dozen pieces of heavy machinery, entailing a total outlay of exceeding \$250,000.

Cohen Construction Co., Blytheville,

## Reinforcing Bars

Bids are in on about 500 tons of bars for a State hospital building at Gowanda, N. Y. A highway bridge over the Hackensack River in New Jersey will take about 160 tons. About 500 tons was placed recently for a viaduct on Route 21, Section 1, at Newark, N. J. The mill price of 1.75c. a lb., Pittsburgh, or 2.10c., delivered New York, is being maintained on small lots but generally shaded on attractive tonnage.

## Scrap

The scrap market is apparently marking time, with both buyers and sellers withholding trading interest until after Jan. 1. Important movement of scrap is still restricted to export loading of No. 1 and No. 2 heavy melting steel. Prices are unchanged.

Ark., is low bidder on a highway bridge at Marked Tree, Ark., requiring 1100 tons of structural steel. Laclede Steel Co. has been awarded 100 tons and 225 tons of reinforcing bars respectively for buildings at Barksdale, La., and Hot Springs, Ark.

## Scrap

There is no activity whatever by mills or dealers. Prices are nominally unchanged. The only railroad list was issued by the New York, Chicago & St. Louis, 25 carloads.

## 1932 Lake Ore Shipments By Grades and Ranges

Iron ore shipped by water from the Mesaba Range this year, with the exceedingly light total movement, declined to 54 per cent of the total amount shipped as compared with 65 per cent during the previous two years, according to the annual report of the Lake Superior Iron Ore Association. Water shipments from other ranges maintained the same relative position as during the previous two years. Shipments of Bessemer ore held up somewhat better than the non-Bessemer grade, the movement of Bessemer being 20 per cent of the same grade shipped in the previous year, while there was only 13 per cent as much non-Bessemer ore shipped as during 1931. Shipment by grades and ranges are given below:

Total by Grades		Gross Tons
Bessemer	.....	1,257,925
Non-Bessemer	.....	2,065,541
Manganiferous	.....	102,703
Silicious	.....	106,137
Total	.....	3,532,306
Total by Ranges		Gross Tons
Mesaba	.....	1,915,272
Gogebic	.....	666,692
Marquette	.....	333,635
Menominee	.....	304,558
Vermilion	.....	214,575
Cuyuna	.....	97,574
Total	.....	3,532,306

# Fabricated Structural Steel

## Awards 11,250 Tons—New Projects Total Only 3900 Tons

STRUCTURAL steel awards, at 11,250 tons, compare with 9925 tons last week and 35,600 tons two weeks ago. The largest award, 300 tons, for a New Jersey highway viaduct, was awarded to the Phoenix Bridge Co. Other lettings were mainly for public works. Inquiries, at 3800 tons, compare with 10,500 tons last week, and are made up almost exclusively of public projects.

### NORTH ATLANTIC STATES

Iona Island, N. Y., 110 tons, ammunition buildings, to Belmont Iron Works.

New York Central, 1260 tons, viaduct, Bank to Bethune Streets, to Jones & Laughlin Steel Corp.

New York, 265 tons, merchants' refrigerating warehouse, to Belmont Iron Works.

Napanoch, N. Y., 150 tons, State armory, to Lackawanna Steel Construction Corp.

State of Pennsylvania, 260 tons, highway bridge in York County, to American Bridge Co.

Passaic, N. J., 165 tons, turbine rooms at Passaic and Garfield, N. J., for Julius Forstmann Co., to McClintic-Marshall Corp.

Newark, N. J., 3000 tons, viaduct for New Jersey State Highway Department, to Phoenix Bridge Co.

York County, Pa., 250 tons, State highway bridge, to American Bridge Co.

Wilkes-Barre, Pa., 255 tons, post office, to American Bridge Co.

New Bethlehem, Pa., 200 tons, State highway bridge, to Guibert Steel Co.

New Castle, Pa., 230 tons, post office, to Pittsburgh Bridge & Iron Co.

### THE SOUTHWEST

Bryan County, Okla., 250 tons, bridge, to J. B. Klein Iron & Foundry Co.

Wapanucka, Okla., 175 tons, bridge, to Kansas City Structural Steel Co.

### CENTRAL STATES

Piqua, Ohio, 350 tons, municipal power house, to Fort Pitt Bridge Works Co.

Springfield, Ohio, 270 tons, post office, to Pittsburgh Bridge & Iron Co.

State of Indiana, 720 tons, highway bridge at DuBois-Martin counties, to Vincennes Bridge Co.

State of Iowa, 110 tons, highway bridges in Polk and Gasper counties, to Des Moines Steel Co.

South Cedar City, Mo., 250 tons, bridge, to Stupp Brothers Bridge & Iron Co.

State of Missouri, 500 tons, highway bridge in Butler County, to Stupp Brothers Bridge & Iron Co.

Edina, Mo., 175 tons, bridge, to McClintic-Marshall Corp.

State of Nebraska, 200 tons, bridge, to Omaha Steel Works.

### WESTERN STATES

Reno, Nev., 570 tons, post office, to Milwaukee Bridge Co.

San Francisco, 125 tons, temporary trestle way on Golden Gate Bridge, to Moore Dry Dock Co.

San Francisco, 250 tons, Raish apartment building, to Golden Gate Iron Works.

Bakersfield, Cal., 990 tons, Kern River State highway bridge, to McClintic-Marshall Corp.

### NEW STRUCTURAL STEEL PROJECTS

#### NORTH ATLANTIC STATES

Delaware City, N. J., 100 tons, movable span, State highway bridge. Triest & Earle, Philadelphia, low bidder on general contract.

Award latter part of January or early in February.

State of Massachusetts, 250 tons, highway bridges at Pittsfield and Oxford.

Jersey City, N. J., 300 tons, extension to post office; Iovachini Brothers, Highland Park, Pa., low bidders on general contract.

Washington, 1500 tons, Government central heating plant, Rust Engineering Co., Pittsburgh, general contractor.

State of New York, 580 tons, Sullivan County bridge; American Bridge Co., low bidder.

### THE SOUTH

Lauderdale, Fla., 175 tons, post office.

Fort Worth, Tex., 900 tons, post office; James R. Barnes, Springfield, Ohio, and Ideal Construction Co., Inc., Gary, Ind., low bidders on general contract, depending on specifications.

### CENTRAL STATES

Florence, Wis., 200 tons, Wisconsin-Michigan interstate bridge; bids close Jan. 10.

Iowa City, Iowa, 400 tons, bridge.

Big Rapids, Mich., 190 tons, repairs to bridge over Muskegon River.

State of Illinois, 830 tons, three highway bridges at Havana and Baldwin.

Cleveland, 240 tons, extensions for Cleveland Electric Illuminating Co.

### WESTERN STATES

Grand Junction, Colo., 600 tons, bridge over Colorado River.

Whatcom County, Wash., 258 tons, bridge for Bureau of Public Roads over Baker River; bids Jan. 5.

### FABRICATED PLATE

#### NEW PROJECTS

Denver, 4000 tons, water pipe.

Oakland, Cal., 420 tons, of  $\frac{1}{4}$  in., 36 ft. diameter welded steel pipe for East Bay Municipal Utility District; bids Jan. 13.

## Reinforcing Steel

### Awards 1450 Tons—New Projects 4000 Tons

State of New Jersey, 503 tons, viaduct, route 21, section A, over Pennsylvania and Lehigh Valley tracks at Newark, to Faltoute Iron & Steel Co.; J. P. Chapman & Son, Hillside, N. J., general contractors.

Cleveland, 150 tons, extensions for Cleveland Electric Illuminating Co., to Patterson-Leitch Co.

Port Clinton, Ohio, 245 tons, highway bridge, to Pollak Steel Co.

Barksdale, La., 100 tons, officers' quarters at air field, to Laclede Steel Co.

Hot Springs, Ark., 225 tons, Army and Navy Hospital addition, to Laclede Steel Co.

State of Oregon, 100 tons, bridges in four counties, to various bidders.

State of Montana, 100 tons, bridges in five counties, to unnamed bidders.

### NEW REINFORCING BAR PROJECTS

Gowanda, N. Y., 500 tons, State Homeopathic Hospital building; bids in.

State of New Jersey, 160 tons, highway bridge, route 3, section 2.

Lexington, Ky., 1000 tons, Government hospital.

State of Kentucky, tonnage being figured, dam No. 5 on Tennessee River.

Phoenix, Ariz., 100 tons, bridges on three State highway projects; bids Dec. 28.

Sacramento, Cal., 125 tons, Kit Carson school, bids under advisement.

Sacramento, 200 tons, William Land school, bids taken Dec. 29.

San Francisco, 250 tons, extension on pier No. 35.

Fort Mason, Cal., 1500 tons, addition to headquarters building; bids Jan. 17.

Long Beach, Cal., 117 tons, County bridge at Second Street over San Gabriel River.

## Railroad Equipment

United Fruit Co. is in the market for 60 15-ton fruit cars for service on Santa Marta Railway, Colombia.

Succession J. Serrales, Porto Rico, has purchased one 2-4-2 type locomotive from Davenport Locomotive & Mfg. Co.

Consolidated Railways of Cuba have ordered a Brill gasoline rail motor car from American Car & Foundry Export Co.

Eight electric and no steam railroad locomotives were shipped in November, all for domestic account, according to the Bureau of the Census. October shipments consisted of 12 electric locomotives, 10 for domestic and two for foreign service. Orders at the end of November totaled 78 electric and one steam locomotive, all for domestic account.

## Cast Iron Pipe

Boston has awarded 500 tons of 8-in. class B, 500 tons of 12-in. and 200 tons of 16-in. to Warren Foundry & Pipe Corp.

Bangor, Me., has awarded 475 tons of 20-in. to R. D. Wood & Co.

Augusta, Me., has awarded 125 tons of class 150 to R. D. Wood & Co.

Saranac Lake, N. Y., will install one-half mile of 10-in., for which Reconstruction Finance Corp. has approved a loan of \$8,000.

Seattle, Wash., will take bids Jan. 11 on 850 tons (9740 ft.) of Class D or centrifugal B for Railway Avenue seawall.

Los Angeles Metropolitan Water District took bids Dec. 27 for 3580 tons (180 miles) of 5 to 8-in. gas pipe.

Valley Iron Works is low bidder on 393 tons of 60-in. for Indian Irrigation Service at Wapato, Wash.

## Pipe Lines

Leaberry Oil & Gas Co., 3338 Mondawmin Avenue, Baltimore, Harry Leaberry, president, is considering steel pipe line in connection with development program at gas wells in eastern Kentucky, including properties in Pike, Martin, Johnson and other counties. Drilling will be placed under way in about 60 days. Charles E. Krebs, Inc., Charleston, W. Va., is engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until Jan. 9 for steel or wrought iron pipe (Schedule 2824).

Bremerton, Wash., will call for bids soon for 3000 to 4000 ft. 24-in. steel pipe for municipal water service. Alternate bids asked at same time on wood pipe.



# Non-Ferrous Metal Markets Almost at Standstill; Prices Little Changed

NEW YORK, Dec. 27.—The year draws to an end with copper prices still at the lowest levels on record and with buying virtually at a standstill here and abroad. This situation has been accentuated by the holidays. For prompt and first quarter, electrolytic copper is quoted nominally at 5c., delivered Connecticut, with 5.12½c. asked for second quarter. Attempts, thus far unsuccessful, are being made to purchase at 5c. for the second quarter. There are intimations that the present price of 5c. could be shaded for delivery in the next three months. The London market is closed today, but sales have been made at Berlin and Paris at 5.07½c. and 5.10c., C.I.F. Lake copper is unchanged nominally at 5c., delivered New York.

## Tin

With London closed today, as well as yesterday and Saturday, the market is lifeless and devoid of interest. Demand throughout the month has been exceedingly light. Sales have been con-

finied to lots of 5 and 10 tons each. Price changes have been insignificant. Spot Straits tin is quoted today at 22.80c., New York. Quotations and statistics from the London market are unavailable today.

## Lead

The tendency of consumers to keep stocks as low as possible for inventories has slowed up purchases. Such demand as has appeared has been mostly prompt. Sales for January thus far have accounted for no more than one-third of estimated demand. Prices continue unchanged and firm at 2.87½c., St. Louis, and 3c., New York.

## Zinc

The last week can be characterized as one of the most inactive of the year. Despite this, prices remain unchanged at the nominal quotations of 3.12½c., East St. Louis, or 3.49½c., New York. A contributing factor to the firm price situation is that sellers are not pressing for business. Statistically, the

situation is favorable. There are reports that a little metal has been sold for distant future shipment at 3.15c., East St. Louis.

## China Buys Tin Plate Through Boxer Refund

Recent purchases of large quantities of British tin plate and galvanized sheets by the Chinese Ministry of Railways through credits established by the British Boxer Indemnity Refund Committee have proved detrimental to local private firms by depressing the local market, according to a report to the Commerce Department's iron and steel division from Assistant Trade Commissioner E. W. O'Harrow, Shanghai.

It is estimated that 25,000 boxes of tin plate of approximately 1000 gross tons have already been sold by the Government and that a similar quantity is available for release. About 15,000 bundles of approximately 1340 tons of galvanized sheets are said to have been similarly sold.

Prices for tin plate range from \$2.43 to \$2.58 per base box, while galvanized sheets sell for from 1.98c. to 2.04c. a lb., these quotations being about 20 per cent below the Shanghai market value.

As a result of agitation raised by British and other import firms dealing in these products, the British Boxer Indemnity Refund Committee is reported to have taken action to prevent the further disposition in Shanghai of material below replacement cost.

A booklet entitled "Effective Credit Management," outlining some of the credit and collection policies and practices employed effectively by manufacturers and wholesalers, has been issued by the policyholders service bureau of the Metropolitan Life Insurance Co., 1 Madison Avenue, New York. The report also discusses the major aspects of credit service in industrial organization.

Simplified practice recommendation R53-32, being a revision of an earlier program on the simplification of steel spiral rods for concrete reinforcement, has been accorded the required degree of written acceptance by members of the industry, according to an announcement by the division of simplified practice of the Bureau of Standards.

The Week's Prices. Cents Per Pound for Early Delivery

	Dec. 21	Dec. 22	Dec. 23	Dec. 24	Dec. 27
Electrolytic copper, N. Y.*	4.75	4.75	4.75	4.75	4.75
Lake copper, New York	5.00	5.00	5.00	5.00	5.00
Straits tin, spot, N. Y.	22.85	22.80	22.80	22.80	22.80
Zinc, East St. Louis	3.12½	3.12½	3.12½	3.12½	3.12½
Zinc, New York	3.49½	3.49½	3.49½	3.49½	3.49½
Lead, St. Louis	2.87½	2.87½	2.87½	2.87½	2.87½
Lead, New York	3.00	3.00	3.00	3.00	3.00

\*Refinery quotation; price ¼c. higher delivered in Connecticut.  
Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.  
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.  
Antimony, 5.40c. a lb., New York.  
Brass ingots, 85-5-5-5, 5.50c. a lb., New York and Philadelphia.

### From New York Warehouse

#### Delivered Prices, Base per Lb.

Tin, Straits pig	24.50c. to 25.50c.
Tin, bar	26.50c. to 28.50c.
Copper, Lake	7.50c. to 8.50c.
Copper, electrolytic	7.25c. to 8.25c.
Copper, casting	7.00c. to 8.00c.
*Copper sheets, hot-rolled	15.37½c.
*High brass sheets	12.50c.
*Seamless brass tubes	15.25c.
*Seamless copper tubes	14.37½c.
*Brass rods	10.25c.
Zinc, slabs	4.37½c. to 4.87½c.
Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Lead, American pig	3.75c. to 4.25c.
Lead, bar	5.25c. to 6.25c.
Lead, sheets	6.75c.
Antimony, Asiatic	8.00 to 9.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum. No. 1 for remelt-ing, 98 to 99 per cent	16.00c.
Solder, ½ and ½	15.50c. to 16.50c.
Babbitt metal, commercial grade	21.00c. to 32.00c.

\*These prices are also for delivery from Chicago and Cleveland warehouses.

### From Cleveland Warehouse

#### Delivered Prices per Lb.

Tin, Straits pig	26.75c.
Tin, bar	28.75c.
Copper, Lake	6.25c.

Copper, electrolytic	6.25c.
Copper, casting	6.75c.
Zinc, slab	4.25c. to 4.50c.
Lead, American pig	3.75c. to 4.00c.
Lead, bar	7.25c.
Antimony, Asiatic	8.50c.
Babbitt metal, medium grade	16.50c.
Babbitt metal, high grade	30.75c.
Solder, ½ and ½	16.75c.

### Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	3.75c.	4.25c.
Copper, hvy. and wire	3.50c.	4.125c.
Copper, light and bottoms	2.625c.	3.375c.
Brass, heavy	1.75c.	2.25c.
Brass, light	1.25c.	1.75c.
Hvy. machine composition	2.50c.	3.125c.
No. 1 yel. brass turnings	2.125c.	2.50c.
No. 1 red brass or compos. turnings	2.375c.	3.00c.
Lead, heavy	2.25c.	2.50c.
Zinc	1.25c.	1.625c.
Cast aluminum	3.75c.	5.25c.
Sheet aluminum	8.00c.	9.50c.

# Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

## BARS, PLATES, SHAPES

Iron and Steel Bars	
Soft Steel	
F.o.b. Pittsburgh mill	Base per Lb.
F.o.b. Chicago	1.60c.
Del'd Philadelphia	1.91c.
Del'd New York	1.85c.
Del'd Detroit	1.80c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.75c.
C.I.F. Pacific ports	2.10c.

Billet Steel Reinforcing	
(as quoted by distributors)	
F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.60c.

Roll Steel	
F.o.b. mills, east of Chicago dist.	1.70c.
F.o.b. Chicago	1.35c. to 1.45c.
F.o.b. Chicago Heights mills	1.50c.

Iron	
Common iron, f.o.b. Chicago	1.60c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.80c.
Common iron, del'd New York	1.90c.

Tank Plates	
Base per Lb.	
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7935c.
F.o.b. Coatesville	1.70c.
P'gh Sparrows Point	1.70c.
Del'd New York	1.830c.
C.I.F. Pacific ports	2.00c.
Wrought iron plates, f.o.b. P'gh.	3.00c.

Structural Shapes	
Base per Lb.	
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.75c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.8035c.
Del'd Philadelphia	1.7935c.
Del'd New York	1.830c.
C.I.F. Pacific ports (standard)	2.10c.
C.I.F. Pacific ports (wide flange)	2.20c.

Steel Sheet Piling	
Base per Lb.	
F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago mill	2.05c.
F.o.b. Buffalo	2.00c.

Alloy Steel Bars	
(F.o.b. Pittsburgh, Chicago, Buffalo, Massillon or Canton.)	
Alloy Quantity Bar Base,	2.45c. to 2.65c. per Lb.

S.A.E. Alloy Series	
Numbers	Differential per 100 Lbs.
2000 (1% Nickel)	40.25
2100 (1% Nickel)	0.55
3200 (3% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
4200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
4100 Chromium Molybdenum (0.16 to 0.25 Molybdenum)	3.20
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	0.20
4100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
9250 Silicon Manganese Spring Steel (flat)	0.25
Round and Squares	0.50
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is  $\frac{1}{4}$  c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. Billets under 4 x 4 in. carry the steel bar base. Slabs with a section area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2 1/2 in. thick, regardless of sectional area, take the bar price.

Cold Finished Bars*	
Bars, f.o.b. Pittsburgh mill	1.70c.
Bars, f.o.b. Chicago	1.75c.
Bars, Cleveland	1.75c.
Bars, Buffalo	1.75c.
Bars, Detroit	1.90c.
Bars, eastern Michigan	1.95c.
Shafting, ground, f.o.b. mill	1 1/2 in. 3.00c.
	1-3/16 to 1 1/2 in. 2.50c.
	1-9/16 to 1 1/2 in. 2.35c.
	1-15/16 to 2 1/2 in. 2.20c.
	2-15/16 to 3 in. 2.05c.

\* In quantities of 10,000 to 10,000 lb.

## SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets	
Hot-Rolled	
No. 10, f.o.b. Pittsburgh	1.55c.
No. 10, f.o.b. Chicago mill	1.65c.
No. 10, del'd Philadelphia	1.86c.
No. 10, f.o.b. Birmingham	1.70c.
No. 10, c.I.F. Pacific Coast ports	2.17 1/2 c.

Hot-rolled and Annealed	
No. 10, Pittsburgh	1.70c.
No. 10, Chicago mills	1.80c.
No. 10, Birmingham	1.85c.
No. 10, Pacific Coast ports	2.32 1/2 c.
No. 10, wrought iron, Pittsburgh	3.60c.

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.10c. to 2.20c.
No. 24, f.o.b. Chicago mills	2.20c. to 2.30c.
No. 24, del'd Philadelphia	2.41c. to 2.51c.
No. 24, f.o.b. Birmingham	2.35c.
No. 24, c.I.F. Pacific Coast ports	2.85c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.00c.
No. 10 gage, f.o.b. Chicago mills	2.10c.
No. 10 gage, del'd Philadelphia	2.41c.

Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.50c.
No. 20 gage, f.o.b. Chicago mills	2.60c.
No. 20 gage, del'd Philadelphia	2.81c.

Note: Automobile body stock and steel furniture sheets to be quoted henceforth on cold-rolled sheet base prices, with extras for drawing quality.

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago mills	2.95c.
No. 24, del'd Philadelphia	3.16c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, c.I.F. Pacific Coast ports	3.50c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Terns	
No. 24, unassorted, 8-lb. coating, f.o.b. Pittsburgh	2.80c.

Vitrous Enameling Stock	
No. 10, f.o.b. Pittsburgh	2.50c. to 2.60c.
No. 20, f.o.b. Pittsburgh	3.00c. to 3.10c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.30c.
No. 28, Chicago mill	2.40c. to 2.50c.

Tin Plate	
Base per Box	
Standard cokes, f.o.b. P'gh district mill	\$4.25
Standard cokes, f.o.b. Gary	4.35

Terne Plate	
(F.o.b. Morgantown or Pittsburgh) (Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$9.50
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.10
30-lb. coating I.C.	14.90
40-lb. coating I.C.	16.70

## Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.

Base per Lb.	
All widths up to 24 in., Pittsburgh	1.45c.
All widths up to 24 in., Chicago	1.55c.
Cooperage stock, P'gh	1.55c. to 1.60c.
Cooperage stock, Chicago	1.65c. to 1.70c.

Cold-Rolled Strips	
F.o.b. Pittsburgh	2.00c.
F.o.b. Cleveland	2.00c.
Del'd Chicago	2.30c.
F.o.b. Worcester	2.20c.
Fender stock, No. 20, gage, Pittsburgh or Cleveland	2.70c. to 2.75c.

## WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.) (After Dec. 31, extras of 10c a 100 lb. on mixed and joint carloads, 25c on pool carloads and 40c. on less than carloads will be applied on all merchant wire products.)

To Manufacturing Trade	
Bright wire	2.20c.
Spring wire	2.20c.

To Jobbing Trade	
Base per Keg	
Standard wire nails	\$1.95
Smooth coated nails	1.95
Galvanized nails	3.95

Base per Lb.	
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.50c. to 2.65c.
Galvanized staples	2.75c. to 2.90c.
Barbed wire, galvanized	2.60c.

Woven wire fence No. 9 gage, per net ton	\$35.00
Woven wire fence, No. 12 1/2 gage and lighter, per net ton	60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill \$2 a ton over Pittsburgh, and Birmingham mill \$3 a ton over Pittsburgh.

## STEEL AND WROUGHT PIPE AND TUBING

### Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld	
Steel	
Inches	Black Galv.
1/4	51 1/2 28 1/2
3/4	57 34 1/2 4 1/2 23 1/2
1	62 49 1/2 1 1/2 33 16 1/2
1 1/2	65 55 1 1/2 36 20 1/2
2	67 57 1 1/2 38 21

Lap Weld	
2	61 50 1/2 3 26 12 1/2
2 1/2	64 54 3 1/2 33 18 1/2
3	66 56 4 35 22
3 1/2	68 58 4 1/2 37 24 1/2
4	70 60 5 39 26 1/2

Butt Weld, extra strong, plain ends	
1/4	48 33 1/2 1 1/2 17 14 1/2
3/4	53 38 1/2 1 1/2 21 17 1/2
1	59 40 1/2 1 1/2 23 19 1/2
1 1/2	63 44 1 1/2 25 21 1/2
2	65 46 1 1/2 27 23 1/2

Lap Weld, extra strong, plain ends	
2 1/2	50 48 1/2 2 34 18 1/2
3	52 50 2 1/2 36 20 1/2
3 1/2	54 52 2 1/2 38 22 1/2
4	56 54 2 1/2 40 24 1/2
4 1/2	58 56 2 1/2 42 26 1/2
5	60 58 2 1/2 44 28 1/2
5 1/2	62 60 2 1/2 46 30 1/2
6	64 62 2 1/2 48 32 1/2

Discounts on steel and wrought iron pipe are net and not subject to any points or preferentials. Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

### Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel	
2 in. and 2 1/2	1 1/2 in. 1
3 in.	1 1/2 in. 1
3 1/2 in.	1 1/2 in. 1
4 in.	1 1/2 in. 1
4 1/2 in.	1 1/2 in. 1
5 in.	1 1/2 in. 1
5 1/2 in.	1 1/2 in. 1
6 in.	1 1/2 in. 1

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes	
Cold-Drawn	
1 in.	61
1 1/4 to 1 1/2 in.	53
1 1/2 in.	37
2 to 2 1/2 in.	32
2 1/2 to 3 in.	40

Hot Rolled	
2 and 2 1/4 in.	38
2 1/2 and 3 in.	46
3 in.	53

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing	
Per Cent Off List	
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.60% base	50
Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.	

## RAILS AND TRACK SUPPLIES

Rails	
Per Gross Ton	
Standard, f.o.b. mill	\$40.00
Light (from billets), f.o.b. mill	30.00
Light (from rail steel, f.o.b. mill)	38.00

Track Equipment	
Base per 100 Lb.	
Spikes, 9/16 in. and large	\$2.40
Spikes, 1/2 in. and large	2.40
Spikes, boat and barge	2.60
Tie plates, steel	1.75
Angle bars	2.50
Track bolts, to steam railroads	3.50
Track bolts, to jobbers, all sizes, per 100 count	75 per cent off list

## BOLTS, NUTS, RIVETS AND SET SCREWS

### Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Machine bolts	75
Carriage bolts	75
Lag bolts	75
Flange bolts, Non 1, 2, 3 and 7 heads	75
Hot-pressed nuts, blank or tapped, square	75
Hot-pressed nuts, blank or tapped, hexagons	75
C.p.e. and t. square or hex nuts, blank or tapped	75
Washers	7.00c. to 6.75c. per lb. off list

\* F.o.b. Chicago, New York and Pittsburgh.

### Bolts and Nuts

Per Cent Off List

Semi-finished hexagon nuts	75
Semi-finished hexagon castellated nuts, S.A.E.	75
Store bolts in packages, P'gh	75, 25 and 10
Store bolts in packages, Ch'go	75, 25 and 10
Store bolts in pkgs., Cleveland	75, 25 and 10
Store bolts in bulk, P'gh	80
Store bolts in bulk, Chicago	80
Store bolts in bulk, Cleveland	80
Tire bolts	60 and 10

Discount of 75 per cent off on bolts and nuts applies on carload business with jobbers and large consumers.

### Large Rivets

(1/2 in. and larger)

Base per Lb.	
F.o.b. Pittsburgh or Cleveland	\$2.30
F.o.b. Chicago	2.85

### Small Rivets

(7/16 in. and smaller)

Per Cent Off List	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

### Cap and Set Screws

Discounts to Jobbers

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List	
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Milled cap screws, 1 in. dia. and smaller	80 and 25
Milled standard set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread, 1/2 in. and smaller	75 and 10
Upset hex. head cap screws, U.S.S.S. or S.A.E. thread, 1 in. dia. and smaller	80, 25 and 10
Upset set screws, sq. head, 1 in. dia. and smaller	75, 10 and 10
Upset set screws, 1 1/2 in. and larger	75 and 10
Milled studs	70

## SEMI-FINISHED STEEL

### Billets and Blooms

Per Gross Ton

Rerolling, 4-in. to 6-in., inclusive, Pittsburgh	\$26.00
Rerolling, 4-in. to 6-in., inclusive, Youngstown	30.00
Rerolling, 4-in. to 6-in., inclusive, Cleveland	30.00
Rerolling, 4-in. to 6-in., inclusive, Chicago	26.00
Forging quality, Pittsburgh	31.00
Forging quality, Youngstown	31.00

### Sheet Bars

(Open -Hearth or Bessemer)

Per Gross Ton	
Pittsburgh	\$26.00
Youngstown	26.00
Cleveland	26.00

### Slabs

(3 in. x 2 in. and under 10 in. x 10 in.)

Per Gross Ton	
Pittsburgh	\$26.00
Youngstown	26.00
Cleveland	26.00

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Skelp	
(F.o.b. Pittsburgh or Youngstown)	
	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Threaded	1.60c.

Wire Rods	
(Common soft, base)	
	Per Gross Ton
Pittsburgh	\$37.00
Cleveland	37.00
Chicago	38.00

## COKE, COAL AND FUEL OIL

Coke	
	Per Net Ton
Furnace, f.o.b. Connellsville	\$1.75 to \$2.00
Prompt	2.50 to 4.25
Foundry, f.o.b. Connellsville	7.00
Foundry, by-product, Chicago	7.75
Foundry, by-product, delivered in Chicago switching district	10.00
Foundry, by-product, New England, delivered	8.20 to 8.81
Foundry, by-product, Phila.	9.00
Foundry, by-product, Cleveland, delivered	7.82
Foundry, by-product, St. Louis, f.o.b., ore	5.00
Foundry, by-product, del'd St. Louis	8.00
Foundry, by-products, del'd St. Louis	9.00

Coal	
	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.00 to \$1.15
Mine run coking coal, f.o.b. W. Pa. mines	1.10 to 1.25
Gas coal, 1/2-in. f.o.b. Pa. mines	1.25 to 1.40
Mine run gas coal, f.o.b. Pa. mines	1.20 to 1.30
Steam slack, f.o.b. W. Pa. mines	0.25 to 0.35
Gas slack, f.o.b. W. Pa. mines	0.35 to 0.45

Fuel Oil	
	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. f.o.b. Baltimore	
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.
Per Gal. del'd Chicago	
No. 3 industrial fuel oil	2.80c. to 2.90c.
No. 5 industrial fuel oil	2.45c. to 2.50c.
Per Gal. f.o.b. Cleveland	
No. 3 distillate	5.25c.
No. 4 industrial	4.75c.

## REFRACTORIES

Fire Clay Brick	
	Per 1000 f.o.b. Works
High-heat	Intermediate
Duty Brick	Duty Brick
Penn.	\$35.00 \$25.00 to \$30.00
Maryland	35.00 25.00 to 30.00
New Jer.	\$44.00 to \$7.00
Ohio	35.00 25.00 to 30.00
Kentucky	35.00 25.00 to 30.00
Missouri	35.00 25.00 to 30.00
Illinois	35.00 25.00 to 30.00
Ground fire clay, per ton	6.50

Chrome Brick	
	Per Net Ton
Standard size	\$42.50

Silica Brick	
	Per 1000 f.o.b. Works
Pennsylvania	\$38.00
Chicago	47.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick	
	Per Net Ton
Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	\$61.50
Unburned, f.o.b. Baltimore and Chester, Pa.	52.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	38.50
Domestic, f.o.b. Chewelah, Wash.	20.90

## CAST IRON PIPE

	Per Net Ton
6-in. and larger, del'd Chicago	\$38.40 to \$41.40
4-in., del'd Chicago	41.40 to 44.40
6-in. and larger, del'd New York	35.30
4-in., del'd New York	38.30
6-in. and larger, Birm'ham	35.30
4-in., Birm'ham	38.30
Class "A" and gas pipe, \$3 extra.	

# Pig Iron, Ores, Ferroalloys

## VALLEY

Per Gross ton, f.o.b. Valley furnace:	
Basic	\$13.50
Bessemer	15.00
Gray Forge	14.50
No. 2 foundry	14.50
No. 3 foundry	14.00
Malleable	\$14.50 to 15.00
Low phos., copper free	23.00 to 25.00

Freight rate to Pittsburgh or Cleveland district, \$1.89.

## PITTSBURGH

Per Gross ton, f.o.b. Pittsburgh district furnace:	
Basic	\$14.00
No. 2 foundry	15.00
No. 3 foundry	14.50
Malleable	15.00
Bessemer	15.00

Freight rates to points in Pittsburgh district range from 69c. to \$1.26.

## CHICAGO

Per gross ton at Chicago furnace:	
N't'n No. 2 fdy.	\$15.50
N't'n No. 1 fdy.	16.00
Malleable, not over 2.25 sil.	15.50
High phosphorus, sil. 1.50, by rail	23.17
Southern No. 2 fdy.	16.14
Low phos., sil. 1 to 2, Copper free	25.00
Silvery, sil. 8 per cent.	23.67
Bess. ferrosil'n, 15 per cent.	28.92

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including a switching charge.

## ST. LOUIS

Per gross ton at St. Louis:	
No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City	\$17.50
Malleable, f.o.b. Granite City	17.50
Northern No. 2 fdy., del'd St. Louis	18.80
Southern No. 2 fdy., del'd St. Louis	14.56
Northern malleable, del'd St. Louis	18.30 to 18.80
Northern basic, del'd St. Louis	18.30 to 18.80

Freight rates 83c. (average) Granite City to St. Louis; \$2.30 from Chicago; \$4.56 from Birmingham.

## NEW YORK

Per gross ton, delivered New York district:	
* Buffalo, No. 2, del'd east	\$17.41 to \$17.66
East Pa. No. 2 fdy.	14.02
East Pa. No. 2 fdy.	14.52
Freight rates: \$1.52 to \$2.63 from eastern Pennsylvania.	
* Prices delivered to New Jersey cities having rate of \$3.41 a ton from Buffalo.	

## BUFFALO

Per gross ton, f.o.b. furnace:	
No. 2 fdy.	\$16.00
No. 2X fdy.	16.50
No. 1 fdy.	17.50
Malleable, sil. up to 2.25	16.50
Basic	15.50
Lake Superior charcoal, del'd	23.41

## NEW ENGLAND

Per gross ton delivered to most New England points:	
* Buffalo, sil. 1.75 to 2.25	\$19.05
* Buffalo, sil. 2.25 to 2.75	19.05
* Buffalo, sil. 1.75 to 2.25	17.41
* Buffalo, sil. 2.25 to 2.75	17.41
* Ala., sil. 1.75 to 2.25	15.64
* Ala., sil. 2.25 to 2.75	16.14

Freight rates: \$5.05 all rail from Buffalo, and \$5.41 to \$7.91 rail and water from Buffalo when \$1 barge and \$2 to \$2.50 New England freight rate are obtainable; \$5.64 rail and water from Alabama to New England seaboard.

\* All-rail rate.

† Rail-and-water rate.

## CINCINNATI

Per gross ton, delivered Cincinnati:	
Ala. fdy., sil. 1.75 to 2.25	\$13.82
Ala. fdy., sil. 2.25 to 2.75	14.32
Tenn. fdy., sil. 1.75 to 2.25	13.82
N't'n No. 2 foundry	\$17.01 to 17.50
S't'h'n Ohio silvery, 8%	21.02

Freight rates, \$2.02 from Ironton and Jackson, Ohio; \$3.82 from Birmingham.

## CLEVELAND

Per gross ton at Cleveland furnace:	
N't'n No. 2 fdy. (local delivery)	\$15.00
S't'h'n fdy. sil. 1.75 to 2.25	16.14
Malleable (local delivery)	15.00
Ohio silvery, 8 per cent.	21.87
Stand. low. phos., Valley	33.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 65c. average local switching charge; \$3.12 from Jackson, Ohio; \$6.14 from Birmingham.

## PHILADELPHIA

Per gross ton at Philadelphia:	
East. Pa. No. 2	\$13.34 to \$13.84
East. Pa. No. 2X	13.84 to 14.34
East. Pa. No. 1X	14.34 to 14.84
Basic (del'd east. Pa.)	13.50 to 14.00
Malleable	14.74 to 18.04
Stand. low phos. (f.o.b. east. Pa. furnace)	20.00 to 21.00
Cop. b'g low phos. (f.o.b. furnace)	20.00 to 21.00
Va. No. 2	21.79
Va. No. 2X	22.29

Prices, except as specified otherwise, are del'd Philadelphia. Freight rates: 84c. to \$1.79 from eastern Pennsylvania furnaces; \$4.67 from Virginia furnaces.

## BIRMINGHAM

Per gross ton, f.o.b. Birmingham dist. furnace:	
No. 2 fdy., 1.75 to 2.25 sil.	\$11.00
No. 2 soft, 2.25 to 2.75 sil.	11.50
Basic	11.00

## CANADA

Per gross ton:	
Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
No. 1 fdy., sil. 2.25 to 2.75	\$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	\$23.00 to 23.50

## Ferromanganese

Per Gross Ton	
Domestic, 80%, seaboard	\$48.00
Foreign, 80%, Atlantic or Gulf port, duty paid	63.00

Prices for lots of one carload or more; extras applied on less than carload lots.

## Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$21.00

## Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$74.50
50% (less carloads)	82.00
75% (carloads)	120.00
75% (less carloads)	130.00
14% to 16% (f.o.b. Welland, Ont., in carloads)	\$1.00
14% to 16% (less carloads)	26.00

## Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
10%	\$20.50
11%	21.00
12%	21.50
13%	22.50
14%	\$23.50
15%	24.00
16%	25.00
17%	26.50

## Silvery Iron

F.o.b. Jackson County, Ohio, Furnace	
Per Gross Ton	Per Gross Ton
6%	\$18.00
7%	18.50
8%	18.75
9%	19.00
10%	19.50
11%	20.00
12%	\$20.50
13%	21.50
14%	22.50
15%	23.50
16%	24.00
17%	25.50

## Other Ferroalloys

Ferrotungsten, per lb. wa. del. carloads	\$94c.
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## PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$8.50 to \$9.00
No. 2 heavy melting steel	7.00 to 7.50
No. 3 railroad wrought	8.50 to 9.00
Scrap rails	8.50 to 9.00
Rails 3 ft. and under	10.00 to 11.00
Sheet bar crops, ordinary	9.00 to 9.50
Compressed sheet steel	8.25 to 8.75
Hand bundled sheet steel	7.00 to 7.50
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	6.25 to 6.75
Short shov. steel turnings	6.25 to 6.75
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
Cast iron carwheels	8.00 to 8.50
Heavy breakable cast	8.00 to 8.50
No. 1 cast	9.00 to 10.00
Rail. knuckles and couplers	9.50 to 10.00
Rail. coil and leaf springs	9.50 to 10.00
Rolled steel wheels	9.50 to 10.00
Low phos. billet crops	11.00 to 11.50
Low phos. sheet bar crops	11.00 to 11.50
Low phos. plate scrap	10.00 to 10.50
Low phos. punchings	10.50 to 11.00
Steel car axles	11.00 to 11.50

## CHICAGO

Delivered Chicago district consumers:	
Per Gross Ton	Per Gross Ton
Heavy melting steel	\$5.00 to \$5.50
Shoveling steel	5.00 to 5.50

Ferrotungsten, less carloads	\$1.14
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	9.50c.
Ferrocromium, 2% carbon	16.50c. to 17.00c.
Ferrocromium, 1% carbon	17.50c. to 18.00c.
Ferrocromium, 0.10% carbon	19.50c. to 20.00c.
Ferrocromium, 0.06% carbon	20.00c. to 20.50c.
Ferrocromium, del., per lb. contained Va.	\$2.60 to 32.80
Ferrocromium, electric, or blast furnace material, in carloads, 18% Rockdale, Tenn., base per gross ton with \$2 unitage	50.00
Ferrocromium, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	55.00
Ferromolybdenum, per lb. Mo., del.	9.00
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$36.00
Ton lots or less, per ton	41.00
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	\$5.00
2% carbon grade	60.00
1% carbon grade	100.00
Spot prices	\$5 a ton higher

## Ores

Lake Superior Ores, Delivered Lower Lake Ports	
	Per Gross Ton
Old range Bessemer	51.50% iron, \$4.99
Old range, non-Bessemer	51.50% iron
Iron	4.43
Mesabi Bessemer	\$1.50% iron
Mesabi non-Bessemer	51.50% iron
High phosphorus	51.50% iron
Foreign Ore, c.i.f. Philadelphia or Baltimore	4.40
Per Unit	
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	3c. to 8.50c.
Iron, low phos., Swedish, average 68% iron	3c.
Iron, basic or foundry, Swedish, average 65% iron	8c.
Iron, basic or foundry, Russian, aver. 63% iron (nom.)	8c.
Manganese, Caucasian, washed 52%	\$23c.
Manganese, African, Indian, 50-52%	21c. to 22c.
Manganese, Brazilian, 48 to 49%	13c.
Per Net Ton	
Tungsten, Chinese wolframite, duty paid	\$10.00
Tungsten, domestic scheelite	\$8.00 to \$10.00
Chrome, 45%, Cr <sub>2</sub> O <sub>3</sub> , crude, c.i.f. Atlantic seaboard	16.00
Chrome, 48%, Cr <sub>2</sub> O <sub>3</sub> , c.i.f. Atlantic seaboard	18.00
* Quotations nominal in absence of sales.	

## Fluorspar

Per Net Ton	
Domestic, washed gravel 85-5, f.o.b. Kentucky and Illinois mines	\$9.00 to \$10.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	12.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	\$16.00 to 16.75
Domestic, No. 1 ground bulk, 85 to 95% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

# Iron and Steel Scrap

## PITTSBURGH

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$8.50 to \$9.00
No. 2 heavy melting steel	7.00 to 7.50
No. 3 railroad wrought	8.50 to 9.00
Scrap rails	8.50 to 9.00
Rails 3 ft. and under	10.00 to 11.00
Sheet bar crops, ordinary	9.00 to 9.50
Compressed sheet steel	8.25 to 8.75
Hand bundled sheet steel	7.00 to 7.50
Hvy. steel axle turnings	7.00 to 7.50
Machine shop turnings	6.25 to 6.75
Short shov. steel turnings	6.25 to 6.75
Short mixed borings and turnings	5.50 to 6.00
Cast iron borings	5.50 to 6.00
Cast iron carwheels	8.00 to 8



No. 2 busheling.....	\$2.00 to \$2.50
Locomotive tires, smooth.....	7.50 to 8.50
Rails and flues.....	1.25 to 1.75
No. 1 machinery cast.....	6.25 to 6.75
Automotive cast.....	6.75 to 7.25
No. 1 railroad cast.....	5.25 to 5.75
No. 1 agricultural cast.....	5.75 to 6.25
Stove plate.....	5.50 to 6.00
Grate bars.....	5.00 to 5.50
Waste shoes.....	5.75 to 6.25

\*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

## PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel.....	\$6.50 to \$7.00
No. 2 heavy melting steel.....	5.00 to 5.50
No. 1 railroad wrought.....	7.50 to 8.00
Bundled sheets.....	4.00 to 4.50
Hydraulic compressed, new.....	5.50 to 6.00
Hydraulic compressed, old.....	4.00 to 4.50
Machine shop turnings.....	3.50 to 4.00
Heavy axle turnings.....	5.50 to 6.00
Cast borings.....	3.50 to 4.00
Heavy breakable cast.....	8.50 to 9.00
Stove plate (steel works).....	6.00 to 6.50
No. 1 low phosph. heavy.....	10.00 to 10.50
Couplers and knuckles.....	8.00 to 8.50
Roller steel wheels.....	8.00 to 8.50
No. 1 blast furnace.....	3.50 to 3.75
Spec. iron and steel pipe.....	6.50 to 7.00
Shifting.....	12.00 to 13.00
Steel axles.....	12.00 to 13.00
No. 1 forge fire.....	5.50 to 6.00
Cast iron car wheels.....	8.00 to 8.50
No. 1 cast.....	8.00 to 9.00
Cast borings (chem.).....	8.00 to 10.00
Steel rails for rolling.....	9.00 to 9.50

## CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel.....	\$7.00 to \$7.25
No. 2 heavy melting steel.....	6.25 to 6.50
Compressed steel.....	6.00 to 6.50
Light bundled sheet stamp.....	4.00 to 4.50
Iron forge flashings.....	5.25 to 5.75
Machine shop turnings.....	3.25 to 3.50
Short shoveling turnings.....	4.00 to 4.50
No. 1 busheling.....	5.25 to 5.50
Steel axle turnings.....	5.50 to 5.75
Low phosph. billet crops.....	10.00 to 11.00
Cast iron borings.....	3.75 to 4.00
Mixed borings and short turnings.....	3.75 to 4.00
No. 2 busheling.....	3.75 to 4.00
No. 1 cast.....	7.50 to 8.00
Railroad grate bars.....	5.00 to 5.50
Stove plate.....	5.00 to 5.50
Rails under 3 ft.....	8.50 to 9.00
Rails for rolling.....	8.50 to 9.00
Railroad malleable.....	6.75 to 7.00
Cast iron car wheels.....	8.00

## BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:	
No. 1 heavy melting steel.....	\$6.00 to \$6.50
No. 2 heavy melting steel.....	5.50 to 6.00
Scrap rails.....	6.00 to 6.50
New hydraulic comp. sheets.....	5.50 to 6.00
All hydraulic comp. sheets.....	4.50
Iron forge flashings.....	5.50 to 6.00
No. 1 busheling.....	5.50 to 6.00
Hy. steel axle turnings.....	5.50 to 6.00
Machine shop turnings.....	4.00 to 4.50
Knuckles and couplers.....	10.00
Oil and leaf springs.....	10.00
Roller steel wheels.....	10.00
Low phosph. billet crops.....	9.00 to 9.50
Short shov. steel turnings.....	5.50 to 6.00
Short mixed borings and turnings.....	3.75 to 4.25
Cast iron borings.....	3.75 to 4.25
No. 2 busheling.....	3.50 to 4.00
Steel car axles.....	10.00 to 11.00
Iron axles.....	10.00 to 11.00
No. 1 machinery cast.....	9.50 to 10.00
No. 1 cupola cast.....	8.50 to 9.00
Stove plate.....	6.50 to 7.00
Steel rails, 3 ft. and under.....	9.25 to 9.75
Cast iron car wheels.....	9.00 to 9.50
Industrial malleable.....	7.00 to 7.50
Railroad malleable.....	7.00 to 7.50
Chemical borings.....	7.50 to 8.00

## BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel.....	\$7.50 to \$8.00
Scrap steel rails.....	8.00 to 8.50
Short shoveling turnings.....	4.00
Stove plate.....	6.00
Steel axles.....	9.00
Iron axles.....	9.00
No. 1 railroad wrought.....	4.50 to 5.00
Rails for rolling.....	8.00 to 8.50
No. 1 cast.....	8.50
Tram wheels.....	8.50
Cast iron borings, chem.....	8.50

## ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel.....	\$5.50 to \$6.00
No. 1 heavy melting.....	5.00 to 5.50
No. 2 heavy melting.....	5.00 to 5.50
No. 1 locomotive tires.....	5.00 to 5.50
Misc. stand-sec. rails.....	5.25 to 5.75
Railroad springs.....	6.25 to 6.75
Bundled sheets.....	2.00 to 2.50
No. 2 railroad wrought.....	5.00 to 5.50
No. 1 busheling.....	3.50 to 4.00
Cast iron borings and shoveling turnings.....	2.75 to 3.25
Iron rails.....	7.00 to 7.50
Rails for rolling.....	7.00 to 7.50
Machine shop turnings.....	2.00 to 2.50
Heavy turnings.....	3.00 to 3.50
Steel car axles.....	8.50 to 9.00
Iron car axles.....	11.00 to 11.50
Weld. iron bars and trans.....	4.00 to 4.50
No. 1 railroad wrought.....	3.50 to 4.00
Steel rails less than 3 ft.....	7.00 to 7.50
Weld. angle bars.....	6.00 to 6.50

Cast iron car wheels.....	\$5.00 to \$5.50
No. 1 machinery cast.....	4.50 to 5.00
Railroad malleable.....	4.00 to 4.50
No. 1 railroad cast.....	6.25 to 6.75
Stove plate.....	6.00 to 6.50
Relay, rails, 60 lb. and under.....	16.00 to 16.50
Relay, rails, 60 lb. and over.....	20.00 to 21.00
Agricult. malleable.....	4.00 to 4.50

## NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel.....	\$3.50 to \$4.50
No. 2 heavy melting steel.....	3.00
Heavy melting steel (yard).....	1.50
No. 1 heavy breakable cast.....	5.00 to 5.25
Stove plate (steel works).....	2.50 to 2.90
Machine shop turnings.....	0.75 to 1.25
Short shoveling turnings.....	0.75 to 1.25
Cast borings.....	0.50 to 1.00
Steel car axles.....	8.00 to 8.50
Spec. iron and steel pipe.....	2.50 to 2.75
Forge fire.....	2.75 to 3.00
No. 1 railroad wrought.....	4.00 to 4.50
No. 1 yard wrought long.....	3.25 to 3.50
Rails for rolling.....	5.00 to 5.50
No. 1 cast.....	4.50
No. 2 cast.....	4.50
Stove plate (foundry).....	4.50
Malleable cast (railroad).....	4.00 to 4.50
Cast borings (chemical).....	6.00 to 6.50

Per gross ton, delivered local foundries:

No. 1 machinery cast.....	\$9.00
No. 1 heavy cast (cupola size).....	7.50 to 8.00
No. 2 cast.....	4.00 to 4.50

## PITTSBURGH

Base per lb.	
Plates.....	2.85c
Structural shapes.....	2.85c
Soft steel bars and small shapes.....	2.60c
Reinforcing steel bars.....	2.60c
Cold-finished and screw stock.....	2.95c
Round and hexagons.....	3.45c
Squares and flats.....	3.45c
Hoops and bands, under 1/4 in.....	2.95c
Hot-rolled annealed sheets (No. 24).....	3.15c
25 or more bundles.....	3.15c
Galv. sheets (No. 24), 25 or more bundles.....	3.65c
Hot-rolled sheets (No. 10).....	3.10c
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.).....	\$3.74
Spikes, large.....	2.40c
Small.....	2.65c to 2.90c
Boat.....	2.90c
Track bolts, all sizes, per 100 count.....	70 per cent off list.
Machine bolts, 100 count.....	70 per cent off list.
Carriage bolts, 100 count.....	70 per cent off list.
Nuts, all styles, 100 count.....	70 per cent off list.
Large rivets, base per 100.....	\$3.04
Wire, black, soft ann'd, base per 100 lb.....	2.75
Wire, galv. soft, base per 100 lb.....	3.20
Common wire nails, per keg.....	2.35
Cement coated nails, per keg.....	2.35

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

## CHICAGO

Base per lb.	
Plates and structural shapes.....	3.00c
Soft steel bars.....	2.75c
Reinforce. bars, billet steel.....	1.35c to 1.40c
Rail steel reinforcement.....	1.15c to 1.25c
Cold-fn. steel bars and shafting.....	3.00c
Rounds and hexagons.....	3.00c
Flats and squares.....	3.50c
Bands, 3/16 in. (in Nos. 10 and 12 gages).....	2.95c
Hoops (No. 14 gage and lighter).....	3.50c
Hot-rolled annealed sheets (No. 24).....	3.45c
Galv. sheets (No. 24).....	3.75c
Hot-rolled sheets (No. 10).....	2.75c
Spikes (3/16 in. and lighter).....	3.45c
Track bolts.....	4.30c
Rivets, structural.....	3.75c
Rivets, boiler.....	3.75c
Machine bolts.....	65
Carriage bolts.....	65
Coach and lag screws.....	65
Hot-pressed nuts, sq. tap, or blank.....	65
Hex. head cap screws.....	80 and 10
Cup point set screws.....	75 and 10
Flat head bright wood screws.....	52 1/2 and 10
Soring cotters.....	60
Stove bolts.....	60
Rd. hd. tank rivets, 7/16 in. and smaller.....	65
Wrought washers.....	\$4.50 off list
No. 8 black ann'd wire, per 100 lb.....	\$3.45
Comm. wire nails, base per keg.....	2.30
Cement c'd nails, base per keg.....	2.30

## NEW YORK

Base per lb.	
Plates and struc. shapes.....	3.10c
Soft steel bars, small shapes.....	2.35c
Iron bars, swed. charcoal.....	6.00c to 6.50c
Cold-fn. shafting and screw stock.....	3.20c
Rounds and hexagons.....	3.20c
Cold-roll. strip, soft and quarter hard.....	4.95c
Hoops.....	3.30c
Bands.....	3.30c
Hot-rolled sheets (No. 10).....	3.00c
Hot-rolled ann'd sheets (No. 24).....	3.50c
Galvanized sheets (No. 24).....	4.00c
Standard tool steel.....	12.00c
Wire, black annealed (No. 10).....	3.60c
Wire, galv. annealed (No. 10).....	4.05c
Tire, steel 3/8 x 1/4 in. and larger.....	3.40c
Smooth finish, 1 to 2 1/2 x 1/4 in. and larger.....	3.75c

## BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel.....	\$3.00 to \$3.25
Scrap T rails.....	2.50 to 2.75
Machine shop turnings.....	0.80 to 1.00
Cast iron borings.....	1.05
Bundled sheet iron, long.....	2.00 to 2.10
Purge flashings.....	3.00 to 3.30
Blast furnace scrap.....	0.90 to 1.00
Forge scrap.....	3.00 to 3.25
Shafting.....	9.50 to 10.00
Steel car axles.....	9.00 to 9.50
Wrought pipe.....	4.00 to 4.25
Rails for rolling.....	4.50 to 5.00
Cast iron borings, chemical.....	7.00 to 7.25

Per gross ton delivered consumers' yards:

Textile cast.....	\$7.00 to \$7.50
No. 1 machinery cast.....	7.50 to 8.00
Stove plate.....	5.00 to 5.25
Railroad malleable.....	8.00 to 8.50

## CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel.....	\$3.00 to \$3.50
Scrap rails for melting.....	6.00 to 6.50
Loose sheet clippings.....	1.50 to 2.00
Bundled sheets.....	3.75 to 4.25
Cast iron borings.....	3.25 to 3.75
Machine shop turnings.....	3.00 to 3.50
No. 1 busheling.....	4.50 to 5.00
No. 2 busheling.....	2.75 to 3.25
Rails for rolling.....	6.50 to 7.00
No. 1 locomotive tires.....	7.50 to 8.00
Short rails.....	9.00 to 9.50
Cast iron car wheels.....	6.50 to 7.00
No. 1 machinery cast.....	8.25 to 8.75
No. 1 railroad cast.....	7.75 to 8.25

# Warehouse Prices for Steel Products

Open-hearth spring steel, bases.....	4.50c to 7.00c
Common wire nails, base, per keg.....	\$2.60
Machine bolts, cut thread.....	Per Cent
1/2 x 6 in. and smaller.....	.65 to .65 and 10
1 x 30 in. and smaller.....	.65 to .65 and 10
Carriage bolts, cut thread.....	Per Cent
1/2 x 6 in. and smaller.....	.65 to .65 and 10
1 x 20 in. and smaller.....	.65 to .65 and 10
Boiler.....	2-in. \$18.05
Lap welded, 2-in.....	19.24
Seamless welded, 2-in.....	24.94
Charcoal iron, 2-in.....	63.65
Charcoal iron, 4-in.....	63.65

\*No. 28 and lighter, 36 in. wide, 20c higher per 100 lb.

## ST. LOUIS

Base per lb.	
Plates and struc. shapes.....	3.25c
Bars, soft steel or iron.....	3.00c
Cold-fn. rounds, shafting, screw stock.....	3.36c
Hot-rolled annealed sheets (No. 24).....	3.70c
Galv. sheets (No. 24).....	4.00c
Hot-rolled sheets (No. 10) up to and incl. 48 in. wide.....	3.00c
over 48 in. wide.....	3.15c
Gal. corrug. sheets (No. 24).....	3.75c
Gal. corrug. sheets.....	4.05c
Structural rivets.....	4.00c
Boiler rivets.....	4.00c

Per Cent Off List

Tank rivets, 7/16 in. and smaller, 100 lb. or more.....	65
Less than 100 lb.....	70
Machine bolts.....	70
Carriage bolts.....	70
Lag screws.....	70
Hot-pressed nuts, sq. blank or tapped, 200 lb. or more.....	70
Less than 200 lb.....	60
Hot-pressed nuts, hex. blank or tapped, 200 lb. or more.....	70
Less than 200 lb.....	60

## PHILADELPHIA

Base per lb.	
Plates, 1/4-in. and heavier.....	2.45c
Structural shapes, small shapes, iron bars (except bands).....	2.45c
Reinforce. steel bars, sq. twisted and deformed.....	2.35c
Cold-fn. steel, rounds and hex.....	3.35c
Cold-fn. steel, sq. and flats.....	3.85c
*Steel hoops.....	3.00c
*Steel bands, No. 12 to 2 1/8 in. incl.....	2.75c
Spring steel.....	5.00c
Hot-rolled annealed sheets (No. 24).....	3.55c
Galvanized sheets (No. 24).....	3.75c
*Hot-rolled annealed sheets (No. 10).....	2.90c
Diam. pat. floor plates, 1/4 in.....	5.00c
Swedish iron bars.....	5.00c

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

\*Base prices subject to deductions on orders aggregating 4000 lb. or over.

## CLEVELAND

Base per lb.	
Plates and struc. shapes.....	2.95c
Soft steel bars.....	2.75c
Reinforce. steel bars.....	1.75c to 1.95c
Cold-fn. rounds and hex.....	2.95c
Cold-fn. flats and sq.....	3.45c
Flat rolled steel under 1/4 in.....	3.00c
Cold-finished strip.....	5.55c
Hot-rolled annealed sheets (No. 24).....	3.25c
Galvanized sheets (No. 24).....	3.75c
Hot-rolled sheets (No. 10).....	3.00c
Black ann'd wire, per 100 lb.....	\$2.75
No. 9 galv. wire, per 100 lb.....	3.20
Comm. wire nails, base per keg.....	2.35

\*Net base, including boxing and cutting to length.

## CINCINNATI

Base per lb.	
Plates and struc. shapes.....	3.25c
Bars, soft steel or iron.....	3.00c
New billet reinforce. bars.....	2.90c
Rails steel reinforce. bars.....	3.00c

Borned cast.....	\$4.25 to \$4.75
Stove plate.....	4.25 to 4.75
Agricultural malleable.....	6.75 to 7.25
Railroad malleable.....	7.00 to 7.50

## DETROIT

Dealers' buying prices per gross ton:	
Hyv. melting steel.....	\$4.50 to \$5.00
Borings and short turnings.....	2.00 to 2.50
Long turnings.....	1.50 to 2.00
No. 1 machinery cast.....	7.75 to 8.25
Automotive cast.....	8.00 to 8.50
Hydraulic comp. sheets.....	4.00 to 4.50
Stove plate.....	3.00 to 3.50
New No. 1 busheling.....	3.50 to 4.00
Old No. 2 busheling.....	1.50 to 2.00
Sheet clippings.....	1.25 to 1.75
Flashings.....	2.75 to 3.25

## CANADA

Dealers' buying prices per gross ton:	
Heavy melting steel.....	\$5.00 to \$6.00
Rails, scrap.....	7.00

# PLANT EXPANSION AND EQUIPMENT BUYING

## ◀ NORTH ATLANTIC ▶

**Continental Can Co., Inc.**, 1 Pershing Square, New York, manufacturer of tin cans and other metal containers, has acquired factory at Memphis, Tenn., about 45,000 sq. ft. floor space, and will remodel for new branch plant. It is understood that company will remove one of plants at Nashville, Tenn., formerly operated by Federal Can Co., to new location and increase capacity.

**New Amsterdam Brewing Co.**, 10 East Fortieth Street, New York, Herbert L. Noll, president, recently organized, let general contract to Chanin Construction Co., Inc., 122 East Forty-second Street, for multi-story brewing plant at Middle Village, Queens Borough, on 22-acre tract lately purchased. Plant will include power house, machine shop, pumping plant and other mechanical units. Cost about \$2,000,000 with machinery. C. Dale Badgley, 24 West Sixty-ninth Street, is architect.

**Signal Supply Officer**, Army Base, Brooklyn, asks bids until Jan. 3 for ball bearings (Circular 39), 102 ammeters and 101 voltmeters (Circular 40); until Jan. 9, 170 manhole tops (Circular 41).

**Sea & Air Instruments Corp.**, New York, has been organized by John O'Dea, 1216 Nelson Avenue, Bronx, and Howard DeMartini, 1825 West Eleventh Street, Brooklyn, to manufacture measuring instruments and other precision equipment.

**International Mailing Tube & Wrapper Co.**, 40 Flatbush Avenue Extension, Brooklyn, manufacturer of cardboard mailing tubes, corrugated containers, etc., has purchased one-story factory, about 28,000 sq. ft. floor space, on Re-view Avenue, Long Island City, for new plant.

**General Motors Corp.**, Broadway and Fifty-seventh Street, New York, has filed plans for extensions and improvements in six-story automobile service, repair and storage building on Eleventh Avenue. Cost about \$25,000. Sidney Daub, 63 Park Row, is architect.

**New York Power & Light Co.**, 126 State Street, Albany, N. Y., is planning new artificial gas plant at North Greenwich, N. Y. Cost close to \$50,000 with equipment.

**Superintendent of Lighthouses**, Staten Island, N. Y., asks bids until Jan. 3 for 77 buoy bodies from 5 ft. diameter and 15 ft. long to 9 ft. diameter and 33 ft. long, each with skeleton lantern tower and bottom counterweight (Proposal 42056).

**Lock-Me-Tight, Inc.**, New York, has been organized by H. William Loss, 270 Broadway, New York, and George W. Schwill, 770 Bushwick Avenue, Brooklyn, to manufacture special locks and locking devices.

**Lion Brewery**, Columbus Avenue and 108th Street, New York, is considering expansion and modernization program to double present capacity. Cost over \$400,000 with equipment. Pasquale Ferri is secretary and general manager.

**General Talkie Equipment Co.**, 175 Fifth Avenue, New York, manufacturer of sound producing equipment and devices, has leased floor in building at 320 Jackson Avenue, Long Island City, for new plant.

**Carroll-McCreary Co., Inc.**, 21-51 Borden Avenue, Long Island City, manufacturer of iron and steel products, plans rebuilding part of one-story plant, recently damaged by fire.

**Chevrolet Motor Co.**, Detroit, has resumed operations in all departments at branch assembling plant at Tarrytown, N. Y., and Fisher Body Co., Detroit, an affiliated organization, has also started up body manufacture for Chevrolet cars at Tarrytown works, both plants recalling about 2000 men. This quota probably will be increased to 3000 workers next month.

**Daniel Zeman**, 5017 Hudson Boulevard, North Bergen, N. J., manufacturer of automobile bodies, has acquired part of former plant of Perryman Electric Co., North Bergen, 114 x 137 ft., and will remodel for new plant to provide about 17,000 sq. ft. floor space.

**Hy-Grade Mfg. & Plating Co.**, 29 Congress Street, Newark, manufacturer of exhaust horns and signals for automobiles, etc., is operating on increased production schedule, five and one-half day week basis.

**United Electrical Mfg. Co.**, Newark, care of Clinton R. Silkey, 164 North Oraton Park-

way, East Orange, N. J., has been organized by Mr. Silkey and Hugh W. Roughley, 77 Alexander Avenue, Nutley, N. J., to manufacture electrical equipment and supplies.

**Best Mfg. Co.**, 1200 Grove Street, Irvington, N. J., manufacturer of magnetic and dynamic radio loud speakers, electric relays, etc., has adopted an eight-hour night shift in addition to full time six-day week schedule, with increased working force.

**State Purchase Commissioner**, State House, Trenton, N. J., asks bids until Jan. 3 for quantity of aluminum.

**Sayre Brewing Co.**, Sayre, Pa., is planning plant improvements and modernization. Cost over \$50,000 with equipment.

**Minisink Paper Co.**, 135 East Forty-second Street, New York, manufacturer of manila wrapping papers, cardboard specialties, etc., has leased former mill of Analomink Paper Co., North Water Gap, Pa., for new plant.

**American Radiator & Standard Sanitary Corp.**, 1803 Elmwood Avenue, Buffalo, is planning to reopen local foundry in January, following curtailment for several weeks.

**Allegany Refineries, Inc.**, Bolivar, N. Y., A. L. Shaner, head, has plans for new oil refinery on local site. Division will be installed for gasoline production. Project will include power house and machine shop. Cost over \$200,000 with equipment. Company was recently organized by Mr. Shaner and associates with capital of \$500,000. H. S. Bell, Inc., Woolworth Building, New York, is consulting engineer.

**USL Battery Corp.**, 3215 Highland Avenue, Niagara Falls, N. Y., manufacturer automobile electric storage batteries, etc., is increasing production schedule and adding to working force. Company has recently secured large order for battery units from Willys-Overland Co., Toledo, Ohio.

**Witte-man Co.**, Buffalo, N. Y., has been organized by C. G. Witte-man and associates, to take over and expand company of same name at 842 Elk Street, manufacturer of brewery machinery and parts.

## ◀ SOUTH ATLANTIC ▶

**Board of District Commissioners**, District Building, Washington, plans new one-story foundry at district reformatory, Lorton, Va.

**Tybee Water Works**, Savannah Beach, Ga., A. Perry Solomon, president, plans installation of electric-operated pumping machinery, 100,000-gal. capacity steel tank on 125-ft. tower, and other mechanical equipment, in connection with extensions and improvements in waterworks.

**Construction Service**, Veterans' Administration, Washington, asks bids until Jan. 17 for new steam power house and other buildings at institution at Lake City, Fla., including steel shelving, cabinets and partitions, steel stairs, steel sash, incinerator, electric distribution systems, etc.

**Wofford Oil Co.**, Atlanta, Ga., plans new oil storage and distributing terminal on waterfront at East Boundary, including steel tanks, pumping machinery and other equipment. Cost over \$150,000.

**McGriffin & Co.**, 16 South Hogan Street, Jacksonville, Fla., operating steamship lines, plans installation of two traveling cranes in new terminal and warehouse, 85 x 225 ft., to be built on waterfront. Hillyer & Reynolds, Buckman Building, are consulting engineers.

**General Purchasing Officer**, Panama Canal, Washington, asks bids until Jan. 9 for wire rope, twist drills, files, foundry nails, steel ties, rail clips, track bolts, hacksaw frames, globe valves, throttle valves, concrete mixer and other equipment (Schedule 2824).

**City Council**, Durham, N. C., plans installation of pumping machinery and other equipment in connection with proposed sewage disposal plant on Neuse River. Entire project to cost about \$450,000. R. W. Flack is city manager.

**Bureau of Yards and Docks**, Navy Department, Washington, asks bids until Jan. 4 for electrical distribution system at Naval Ammunition Depot, St. Juliens Creek, Va., including manholes, wire, cable, switchgear, switch houses, transformers and complete accessories (Specification 7108).

**Sumter Electric Rewinding Co.**, Sumpter, S. C., operating a motor rewinding works, is planning purchase of one or more Diesel oil engines.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Jan. 4 for machinists' chisels and chisel blanks (Schedule 9291) for Brooklyn, Boston, Norfolk and Mare Island Navy Yards; miter box saws, band saws, cross-cut saws, rip saws, keyhole saws, miter boxes, etc. (Schedule 9292) for Brooklyn, Mare Island and San Diego Navy Yards; 30,340 doz. tungsten hacksaw blades (Schedule 9299) for Brooklyn and Mare Island yards; 210 sets ballast resistors (Schedule 9309) for different navy yards; until Jan. 10, quantity reamers (Schedule 9321), hammers, file and tool handles (Schedule 9313) for Mare Island and Brooklyn yards; ratchet braces, breast drills, etc. (Schedule 9311), sharpening stones (Schedule 9315), files (Schedule 9305), emergency feed pumps, fire pumps, bilge pumps and spare parts (Schedule 9311) for Eastern and Western yards; 460 gasoline torches (Schedule 9314) for Brooklyn, Boston and Mare Island yards.

## ◀ CENTRAL DISTRICT ▶

**Victor Brewing Co., Inc.**, Jeannette, Pa., has arranged for stock issue of \$193,500, part of proceeds to be used for plant improvements and modernization, including equipment.

**New Castle Chemical Co.**, New Castle, Pa., recently organized to manufacture industrial chemicals, etc., has taken over and will occupy local plant of Westmoreland Products Co., manufacturer of chemicals, recently in receivership.

**Borough Secretary**, Borough Building, Coraopolis, Pa., asks bids until Jan. 17 for one full Diesel engine, 180-hp. capacity, direct-connected to generator and exciter units, at waterworks station.

**J. C. Stine Co.**, Tyrone, Pa., manufacturer of pumping machinery, mining equipment, iron castings, etc., plans rebuilding part of plant destroyed by fire Dec. 17. Loss over \$100,000 with equipment.

**City Council**, Delphos, Ohio, plans early calls for bids for electrification of municipal waterworks, including new equipment. City engineer in charge.

**Ohio State Brewing Co.**, Columbus, Ohio, Edward Prior, Jr., 406 Yuster Building, in charge, has plans for new three and five-story brewing plant in south side district, with power house, machine shop and other mechanical units. Cost over \$400,000 with machinery. Harry Roderick and Floyd Freeman, 42 East Gay Street, are architects.

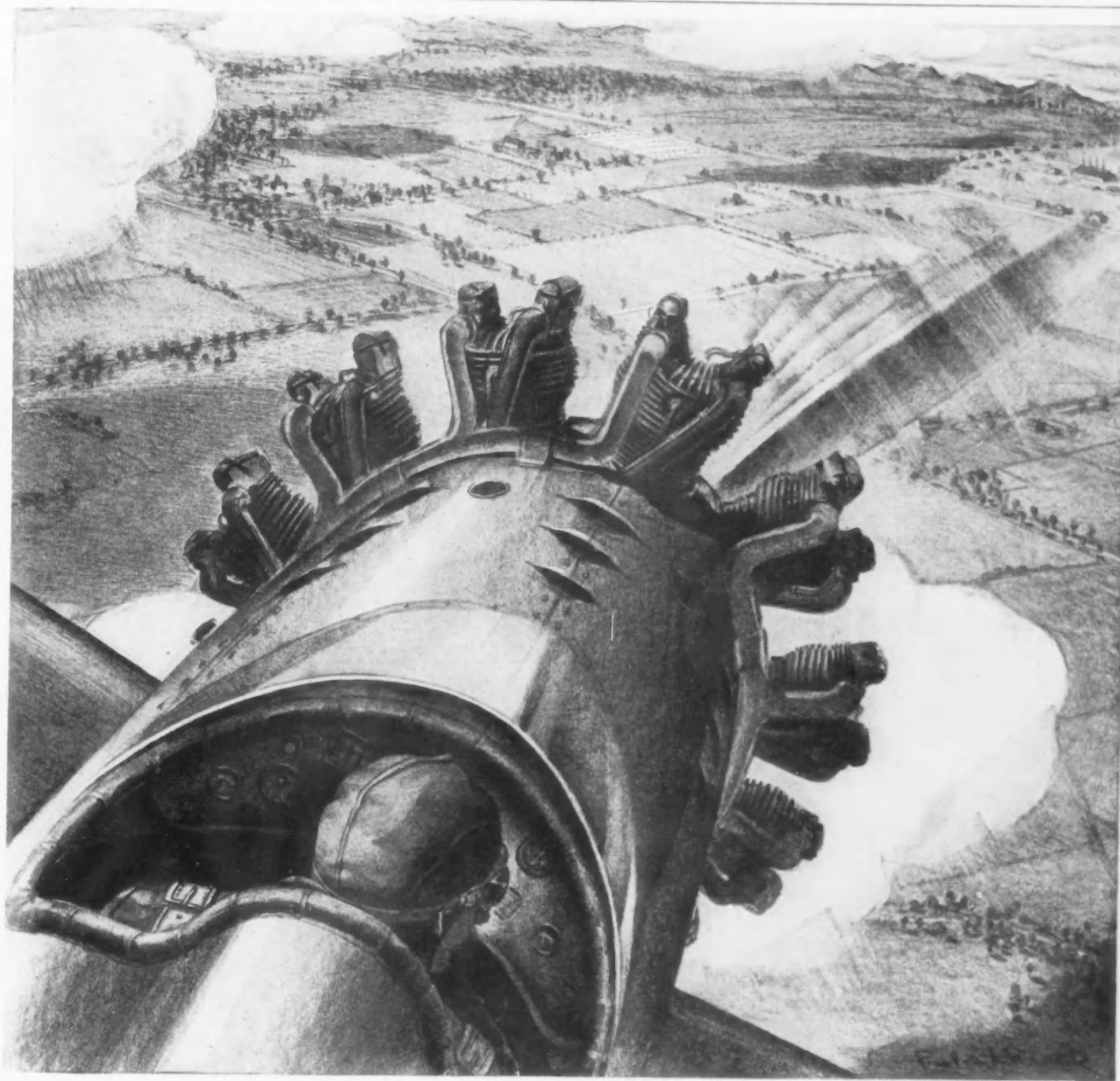
**W. O. Larson Foundry Co.**, Cleveland, care of Thompson, Hine & Flory, Guardian Building, representative, has been organized by B. R. Harman and associates, to manufacture metal castings.

**Bruckmann Co.**, Ludlow Avenue and Rapid Transit, Cincinnati, plans improvements and modernization in brewing plant, including additional equipment. Cost over \$80,000. Stewart & Stewart, 622 Broadway, are architects. William Bruckmann is president.

**Contracting Officer**, Material Division, Wright Field, Dayton, Ohio, asks bids until Jan. 3 for tube assemblies (Circular 283), 136 exhaust silencers and 132 exhaust manifolds (Circular 285), 550 tail wheel anti-shimmy device pressure springs, 348 tail-wheel anti-shimmy device plate assemblies, 100 tail wheel anti-shimmy device fraction disks, stabilizer spar brace struts, attachment fittings, etc. (Circular 288); until Jan. 4, six ski wheels and two sets attaching parts and ski alignment fittings (Circulars 284 and 287); until Jan. 9, two tool room precision lathes (Circular 293), float assemblies, auxiliary fuel tank gage spiral shaft assemblies, auxiliary fuel tank gage flanges, auxiliary fuel tank gage assemblies, etc. (Circular 290), 244 gun track support brackets (Circular 295); until Jan. 16, two radial drill presses, one 13-in. column and 3-ft. arm, and other 15-in. column and 4 ft. arm (Circular 298), adapter assemblies, gear box assemblies, fuel collector assemblies, coupling assembly, fuel injection test equipment fuel tank, etc. (Circular 291), steel aircraft bolts, clevis bolts and steel washers (Circular 294).

**Patterson Foundry & Machine Co.**, East Liverpool, Ohio, is developing an addition line of





... hour after hour without a stop  
It takes GOOD alloy to meet these tests

# ILLINOIS *alloy* STEEL

ALWAYS DEPENDABLE

By every known care and every known test, Illinois Steel Company controls the uniformity of its alloy steel that the tests of time and use may be met without flaw or failure.



**Illinois Steel Company**  
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

— 208 South La Salle Street, Chicago, Illinois —



output, covering new coal-burning stoker equipment for domestic and industrial service.

**Heekin Can Co.**, 435 New Street, Cincinnati, manufacturer of tin cans, etc., completed plans for remodeling factory on East Sixth Street, and will have unit ready for service early next year. R. L. Sayre, 1301 Ault View Place, is engineer.

**Purchasing and Contracting Officer**, Quartermaster Corps, Fort Benjamin Harrison, Ind., asks bids until Jan. 10 for iron wire, locks, screws, electric supplies, etc. (Circular 16).

**Board of Public Works**, Anderson, Ind., plans installation of pumping machinery and other equipment in connection with new water-softening plant for municipal waterworks. Cost about \$125,000. Allen & Vagtborg, 205 West Wacker Drive, Chicago, are consulting engineers.

**K. & M. Adjustable Bed Spring Rest Co.**, Grand Rapids, Mich., recently organized, has arranged with Grand Rapids Malleable Iron Works for manufacture of a patented iron bed spring rest, including parts and assembling. Expect to develop output of over 500 sets weekly at early date.

**Rich Steel Products Co.**, 9771 French Road, Detroit, and **Rich Tool Co.**, same address, have been organized by officials of Wilcox-Rich Corp., address noted, manufacturer of automobile equipment, steel products, tools, etc., as affiliated interests, to manufacture steel specialties and tools, etc., respectively.

**Page Steel & Wire Co.**, Adrian, Mich., has adopted full time production schedule for first time in 24 months. Brake manufacturing and cable divisions are on ten-hour day, six-day week schedule, with about 150 employees.

## ◀ SOUTH CENTRAL ▶

**Emory Pipe & Foundry Co., Inc.**, Anniston, Ala., W. C. Wilson, president, is considering new one-story foundry in neighboring city. Plant will have initial capacity for melting about 1000 tons a month. Cost over \$50,000 with equipment.

**Taylor, Lowenstein & Co.**, Mobile, Ala., manufacturers of turpentine, rosin and other naval stores, has leased property at Waycross, Ga., for one-story addition to plant at that place. Cost close to \$40,000 with equipment.

**Bavarian Brewing Co.**, Twelfth and Pike Streets, Covington, Ky., recently acquired by new interests, headed by Murray Vorhees, has engaged Leslie S. Deglow, 9 West Fourth Street, Cincinnati, architect, to prepare plans for extensions and improvements. Cost close to \$200,000 with equipment.

**Memphis Cottonseed Products Co.**, Tanglewood Street, Memphis, Tenn., plans rebuilding of portion of storage and distributing plant, recently destroyed by fire. Loss about \$50,300 with equipment.

**Southern Metals & Enameling Co.**, Huntsville, Ala., recently organized by George Steingruber and associates, has acquired local plant of Electric Bell Range Co., for manufacture of metal stampings, iron-enameled products, etc. Mr. Steingruber will be general manager.

## ◀ SOUTHWEST ▶

**Board of Education**, Normandy, Mo., plans mechanical shops and vocational department in three-story and basement addition to high school, for which bids will be asked on general contract early in January. Cost about \$225,000. William B. Ittner, Inc., Continental Life Building, St. Louis, is architect and engineer.

**Freedman Piston Corp.**, St. Louis, has been organized by Louis Freedman and Karl P. Spencer, 705 Olive Street, to manufacture pistons for automobile engines and kindred products.

**Blackwell Zinc Co.**, Blackwell, Okla., a subsidiary of American Metal Co., 61 Broadway, New York, is arranging for resumption of operations at local smelter early in January, after shut-down of several months, and will reinstate about 150 men.

**City Water Department**, Tulsa, Okla., plans installation of pumping machinery and auxiliary equipment in connection with new reservoir for municipal waterworks at Mohawk pumping station. Cost about \$200,000.

**Pure Oil Co.**, 35 East Wacker Drive, Chicago, plans rebuilding part of oil refinery at Muskogee, Okla., recently damaged by fire. Loss over \$70,000 with equipment.

**City Council**, St. Charles, Mo., has called special election on Jan. 5 to approve bond issue of \$300,000 for a municipal electric light and power plant. Russell & Axon, Roosevelt Building, St. Louis, are consulting engineers.

**American Vending Machine Co.**, Kansas City, Mo., has been organized by Albert D. McKelvey and Richard G. Warner, 15 East Winthrop Road, to manufacture vending machines and parts, and other mechanical equipment.

**City Council**, Springfield, Mo., plans installation of pumping machinery and other equipment in new sewage disposal plant. Work will be carried out in connection with sewage improvement program to cost \$275,000. Special election will be held Jan. 12 to vote bonds. John F. Hendrickson, city engineer, is in charge.

**Midland Gasoline Co.**, Trinity Life Building, Fort Worth, Tex., plans new gasoline refinery at Conroe, Tex. Present unit at Coleman, Tex., will be removed to new location and capacity increased.

**Great Lakes Coal & Coke Co.**, 910 South Michigan Avenue, Chicago, plans addition to coke loading plant on waterfront at Port Arthur, Tex., for crushing, screening and sizing unit. Cost about \$25,000 with equipment.

**City Council**, Tyler, Tex., plans installation of pumping machinery and other equipment in connection with sewage expansion and improvement program. Fund of \$100,000 has been secured for work.

## ◀ NEW ENGLAND ▶

**Hand Brewery Co.**, Mendon Road, Pawtucket, R. I., is planning plant improvement and modernization. Cost over \$40,000 with machinery. James H. Doorley, 21 Eddy Street, Providence, R. I., in charge.

**New England Steel Rack Co.**, Salem, Mass., has purchased Lane Wharf property, 187 Derby Street, improved with three-story building and smaller structures, and will remodel for manufacture of steel racks and kindred products. Present works will be removed to new location and capacity increased. Andrew J. Abdo is head.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Jan. 4 for one motor-driven brass-finishing lathe and equipment (Schedule 9300) for Portsmouth, N. H., Navy Yard.

**Metal Process Corp.**, Dartmouth, Mass., has been organized by Palmer Scott and Robert E. Belknap, 112 Beacon Street, Boston, to manufacture metal specialties.

**Grote & Wiegel**, 73 Spruce Street, Hartford, Conn., meat packers, have awarded general contract to Industrial Construction Co., 721 Main Street for one-story addition, 32 x 75 ft. George Zunner, 182 High Street, is architect.

**Blake-Rounds Supply Co.**, 26 York Street, Portland, Me., plumbing equipment and supplies, plans rebuilding part of storage and distributing plant, pipe shop, etc., recently destroyed by fire. Loss over \$50,000 with equipment.

**Board of Education**, Greenwich, Conn., plans manual training department in new three-story and basement high school, for which revised plans are being drawn. Cost over \$250,000. Guilbert & Betelle, 20 Branford Place, Newark, N. J., are architects.

## ◀ PACIFIC COAST ▶

**General Petroleum Corp.**, 2525 East Thirty-seventh Street, Los Angeles, has plans for new gasoline refinery at Torrance, Cal., to include seven-unit cracking plant. Costing \$400,000 with equipment, cooling towers to cost \$50,000, cooling system, pipe lines, tanks, etc., distillation and chemical purification plant. Entire works will cost about \$1,500,000 with machinery. All construction will be handled by company forces. Fred Isaacs, manager, refining department, is in charge.

**Board of Water and Power Commissioners**, 207 South Broadway, Los Angeles, has secured permission to use water from Cottonwood Creek and Horseshoe Meadows Fork, Inyo County, for municipal hydroelectric power development. Cost about \$1,936,000 with transmission lines, power substations and power dam; also, use of water from Big Pine Creek, same county, for similar development, to cost about \$3,188,000 with power dam, generating station, transmission lines, etc.

**Bureau of Supplies and Accounts**, Navy Department, Washington, asks bids until Jan. 10 for one motor-driven engine lathe (Schedule 9335) for Puget Sound, Wash. Navy Yard.

**Acme White Lead & Color Works**, 3150 Alosta Street, Los Angeles, plans one-story building, 180 x 250 ft., on East Pico Boulevard. Cost over \$50,000 with equipment for storage and distribution. Claud Beelman, Union Bank Building, is architect. Company

is a subsidiary of Sherwin-Williams Co., Cleveland, Ohio.

**Southern California Edison Co.**, 601 West Fifth Street, Los Angeles, is arranging fund of \$3,982,922 for extensions and improvements in steam-operated and hydroelectric generating plants, transmission and distributing lines, power substations and other structures.

**Elmer L. Lipp**, 3133 San Fernando Road, Los Angeles, has plans for one-story machine shop, 50 x 120 ft., at 3017 San Fernando Road. John M. Cooper, Rives-Strong Building, is architect.

## ◀ MIDDLE WEST ▶

**Shellmar Products Co.**, 3501 West Forty-eighth Place, Chicago, manufacturer of glassine paper specialties, has purchased three-story factory at 600 Eleventh Street, West New York, N. J., for Eastern branch plant.

**Everon Signs, Inc.**, 210 East Ohio Street, Chicago, has been organized by Harry Kleist and Thomas W. Merritt, to manufacture electric and metallic signs and displays.

**Northwestern Public Service Co.**, Huron, S. D., has secured permission to build a high-tension transmission line in Spink County, near Redfield, S. D.

**Public Service Co. of Colorado**, 900 Fifteenth Street, Denver, is considering expansion and improvements at hydroelectric generating plant at Boulder, Colo., including additional equipment. Cost over \$200,000 with machinery.

**Common Council**, Collinsville, Ill., plans installation of pumping machinery and auxiliary equipment in connection with new sewage system. Cost about \$250,000. Kinsey Engineering Co., 515 Court Street, Pekin, Ill., is consulting engineer.

**City Council**, Villisca, Iowa, asks bids until Jan. 10 for following electric light and power plant equipment: Two Diesel engine-generating units, each about 450-hp. capacity, with generators of 300-kw. each; direct-connected exciters, oil storage tanks and pipe line, steel terminal tower, transformers, switchboard and accessories; also for complete electric distribution system. Cost \$150,000. Electric Equipment Co., 207 Grand Avenue, Des Moines, Iowa, is engineer.

**Louis Costello**, Salida, Colo., is at head of project to erect a brewing plant, and will organize company to carry out program. Cost over \$100,000 with equipment.

**Blatz Brewing Co.**, 1316 South Sixth Street, Minneapolis, Minn., is considering plant extensions and improvements, including equipment. Cost about \$40,000 with equipment. Andrew J. Kirk is manager.

**St. Louis Renewable Plowshare Corp.** has been organized as a subsidiary of St. Louis Car Co., 800 Broadway, N. St. Louis, to manufacture a detachable plow share edge. Device fits standard plows and when worn out is detached and replaced by a new edge. Edwin B. Meissner is president of parent company.

## ◀ FOREIGN ▶

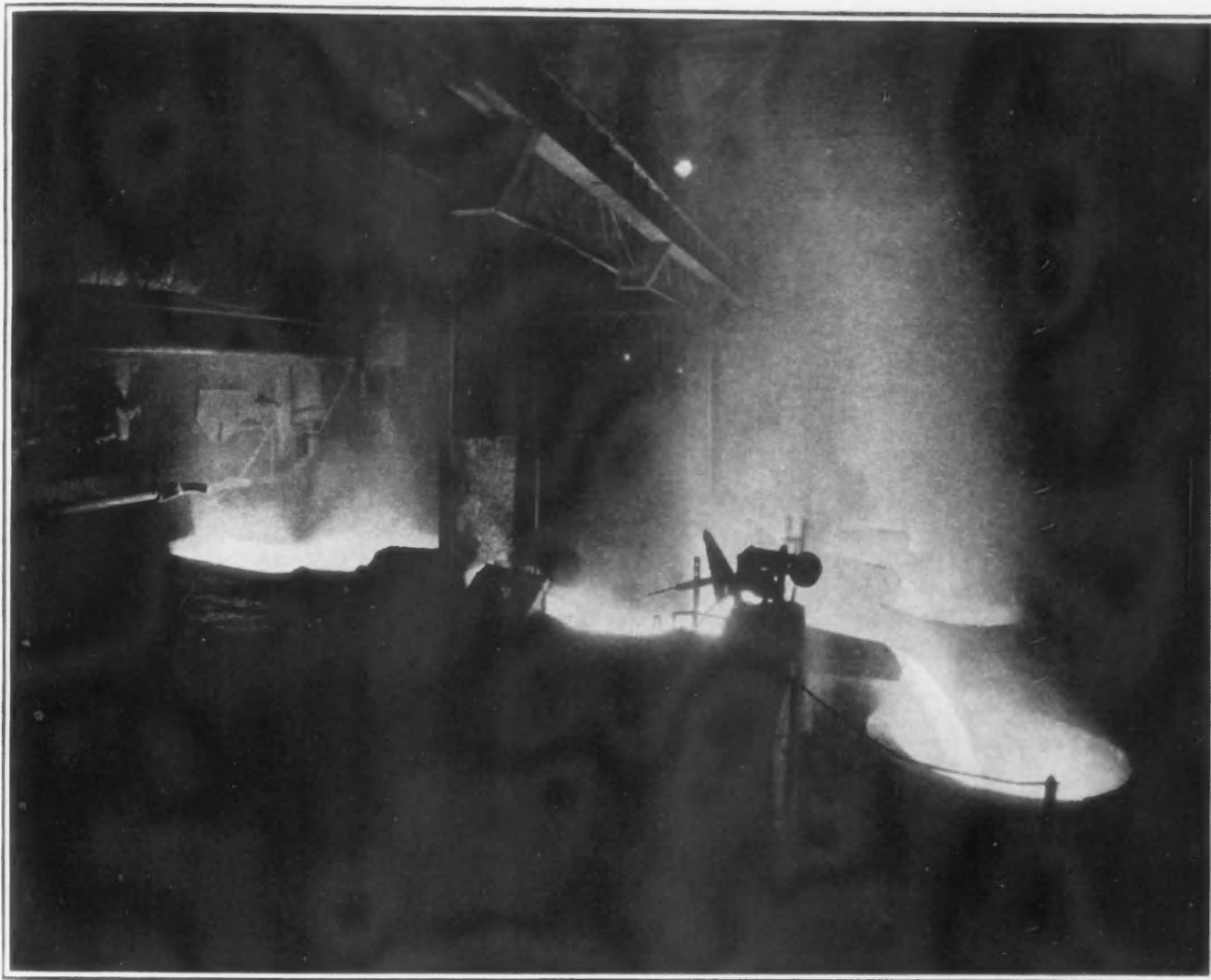
**Lancashire Steel Corp.**, Manchester, England, has purchased Whitecross Co., Ltd., Warrington, England, manufacturer of wire rope and kindred wire products, and will operate as a subsidiary. Plans have been approved for new wire rod mill at last noted plant, for production of wire netting, barbed wire, wire nails and allied wire goods. Cost about £1,500,000 (\$5,010,000), with equipment.

**Soviet Russian Government**, Moscow, People's Commissariat for Light Industry, has authorized erection of two large plants in 1933 for manufacture of pianos and piano mechanisms, at Tiflis and Cherkassy, respectively. Work is under way on new plant at Kolomna for manufacture of talking machines, including radio equipment. Cost of both projects over \$3,500,000 with equipment. Amtorg Trading Corp., 261 Fifth Avenue, New York, is official buying agency.

**Dutch syndicate** now being organized, represented by William Van der Lek, Winnipeg, Man., is negotiating for new beet sugar mill near Winnipeg. Plant will include power house, machine shop and other structures. Cost about \$1,000,000 with machinery.

**Van Norman Machine Tool Co.**, Springfield, Mass., has appointed Charles A. Strelinger Co., 149 Larned Street, East, Detroit, as sales agent for its line of milling machines, oscillating and plunge cut grinders and special production equipment in the Detroit territory.

# PIG IRON AND RECONSTRUCTION



**I**N the period of reconstruction ahead, when American industry will be engaged in making good the depression accumulated deficiencies, the Interlake Iron Corporation is prepared to play its exacting part. . . . Post depression conditions will place upon industry a responsibility for new accomplishments and greater economy and iron and its products will be an important factor in every step of the advance. . . . Iron making is as old as the world's written history and the proficiency of its iron makers and workers has always been the measure

of a people's advancement. . . . In recent decades modern metallurgy has joined coal tar chemistry with iron making and by recovering values formerly wasted, huge economies have become possible in iron and steel making. . . . Science also has shown that the use of different grades of ore will produce iron of differing characteristics—that coke can be produced to meet a definite demand by the use of proper coal. The Interlake Iron Corporation, by virtue of its modern plants and resources covering the full range of iron ore and coal, can meet every requirement.

*[ Interlake Iron Corporation has four well-located blast furnace and by-product plants, with annual capacity of 1,200,000 gross tons of pig iron, 2,000,000 net tons of coke. Its large ore and coal reserves enable it to meet the exact specification of any customer, large or small. ]*

**INTERLAKE IRON CORPORATION**  
PIG IRON & COKE

PICKANDS, MATHER & COMPANY, Sales Agents

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## Correlation of Damping Capacity of Steels With Other Properties

(Continued from Page 989)

50-hr. periods in virgin bars was determined for three different loads for each steel. Only the annealed steels were used, since there is a general impression—though not always correct—that annealed steel has greater resistance to creep over all temperature ranges than heat-treated steel.

By plotting the total flow for the period of time used (48 to 50 hr.) against the respective loads, a load-flow (stress, time-strain) diagram is obtained which represents the stiffness of the steel. A comparison of the slopes of these diagrams with the P diagrams shows that the steels of higher damping capacities show the greater amounts of deformation with time.

With respect to creep resistance the steels tested may be put in the order of their increasing damping capacities at the temperature of test. Figs. 11 to 13.

### Damping Versus Fatigue

Endurance limits were obtained on five of the steels, as listed at right, in three conditions of heat treatment. Notched and unnotched bars were used. The results are given in the accompanying table.

No general conclusion can be drawn. In a single material, however, high damping capacities are associated with low endurance limits but this does not hold for different

Steel	Endurance Limit Unnotched	Endurance Limit Notched	Per Cent Loss Due to Notch
1-A	37,500	22,500	40.0
1-6	57,500	22,000	61.8
1-4	67,500	27,500	59.0
2-A	37,500	22,500	40.0
2-6	57,500	23,500	59.0
2-4	62,500	27,500	56.0
3-A	45,000	20,000	55.5
3-6	65,000	30,000	54.0
3-4	75,000	35,000	53.5
5-A	20,000	5,000	75.0
5-4	35,000	15,000	57.0
5-6	35,000	17,500	50.0
7-A	26,500	20,000	23.0
7-4	40,000	15,000	62.5
77-6	35,000	15,000	57.0

materials. The reduction of endurance limits due to notches, disappointingly, seems to bear no relation to damping capacities.

The table on the following page shows the results on five of the steels, again in three conditions of heat treatment.

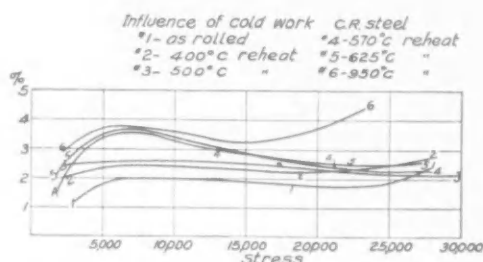


Fig. 9.—Influence of cold work on damping capacity.

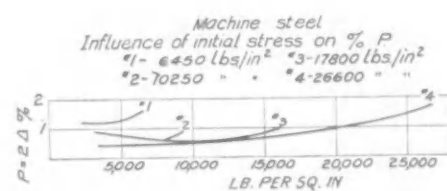


Fig. 10.—Influence of initial stress on damping capacity.

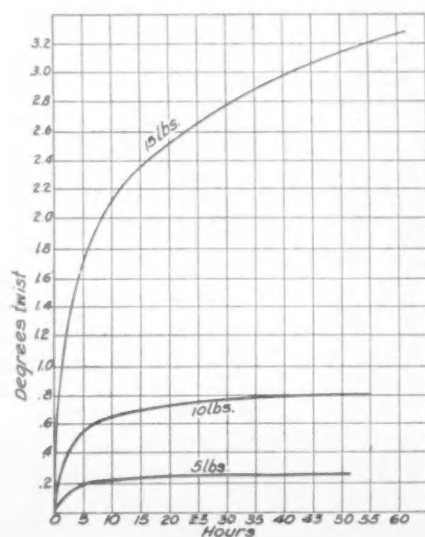


Fig. 11.—Torsion creep of a Ni-Mo steel (No. 1A) at 450 deg. C.

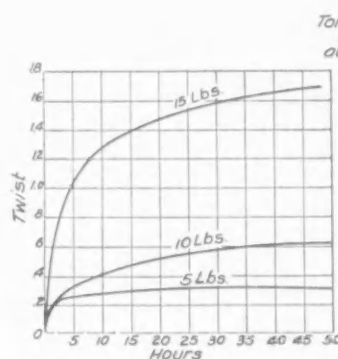


Fig. 12.—Torsion creep of Mo steel (No. 2A) at 450 deg. C.

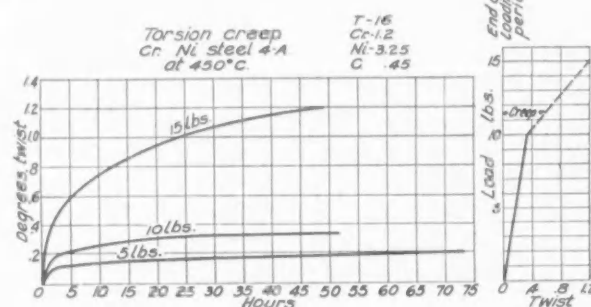


Fig. 13.—Torsion creep of a Cr-Ni steel (No. 4A) at 450 deg. C.

No definite correlation is indicated between either the actual impact values or the Mosher factor and the damping values.

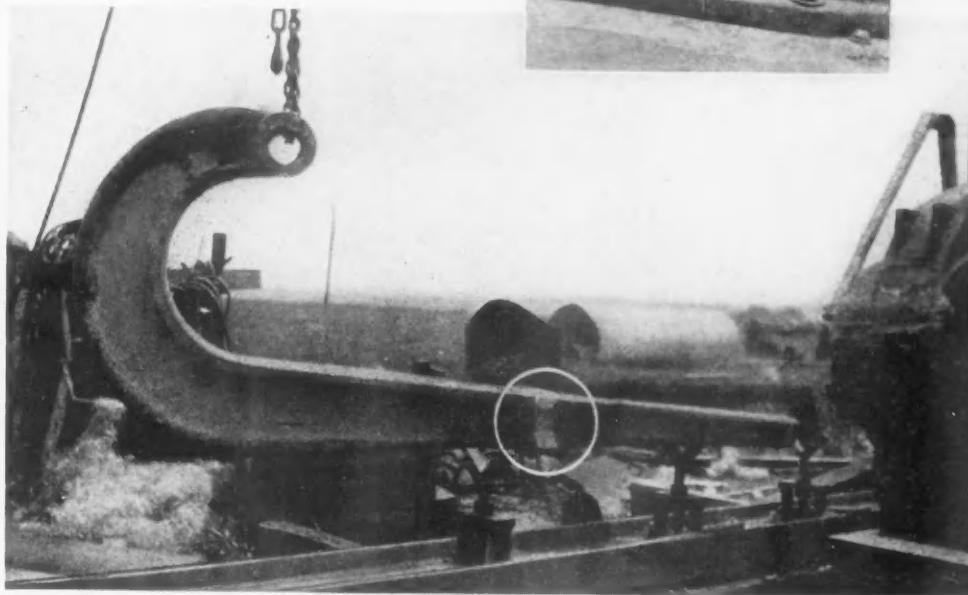
### Conclusion

Damping capacity has been recognized by designers as of real importance in machines subject to vibrations, in that it controls the stresses tending to be set up by them.

(Continued on Page 212)



*Showing the irregular fracture which occurred in this twelve yard dipper hinge and the permanent repair which was quickly made with Thermit Welding.*



## PERMANENTLY REPAIRED at one-tenth the replacement cost

It is not difficult to put your finger on the economy of Thermit Welding. The savings effected by this ready reclamation process usually run to substantial amounts.

For example, Thermit Welding saved the twelve yard dipper hinge shown above at a cost of only \$23.05 for material. A new hinge alone would have cost \$247.50. Moreover, permanently repaired, the shaft was returned to service in a few days time. To replace it would have meant several weeks delay.

The reclamation department prepared to Thermit Weld in such emergencies as this pays large dividends. Broken housings, charging peels, pinion teeth, wobbler ends, and other parts can all be repaired permanently, quickly, and at small cost with Thermit Welding.

Consider the possibilities for such economies in your own plant. As a first step, let us send the booklet, "Thermit Welding." It will answer many questions.

METAL & THERMIT CORPORATION, 120 BROADWAY, NEW YORK, N. Y.

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# THERMIT WELDING



M and T products include numerous alloys and special metals—pure chromium, pure manganese, pure tungsten, ferro-titanium,

ferro-vanadium, ferro-tungsten, manganese copper, manganese titanium, manganese boron, cobalt copper, pig tin, detinned billets.

Steel	Stand- ard Bar	Double Width Standard	Dissi- pation* Factor
1-A	16.3	30.0	93.6
1-B	44.3	89.2	101.0
1-4	29.2	58.4	100.0
2-A	18.8	34.5	91.7
2-B	38.4	77.8	98.7
2-4	15.3	30.8	100.0
3-A	25.6	49.0	95.5
3-B	38.0	77.8	102.0
3-4	15.7	31.5	100.0
5-A	44.3	77.8	88.0
5-B	56.1	117.2	104.0
5-4	49.0	92.3	94.0
No. 6			
Cold rolled	3.2	4.2	65.5
Reheat 400 deg. C.	2.5	4.2	80.5
500 deg. C.	24.3	35.1	72.0
570 deg. C.	29.7	56.6	95.0
625 deg. C.	41.0	67.7	82.5
950 deg. C.	6.5	21.0	160.0

\*Value of double bar  
2 value standard  $\times 100 =$  dissipation factor

It should be considered as another valuable property of engineering materials greatly influenced by their thermal and mechanical histories.

The experiments reported in this discussion show there is probably no general correlation with other properties, with the exception of creep, although more extensive tests should be made, and are being carried on, to definitely determine these points. There is still an intriguing possibility that fatigue properties, and especially the influence of notches in fatigue testing, may depend upon the



Fig. 3—A special form of dump truck is used for transporting scrap

damping effect as stated by Van Heydekampf. Some of the results reported indicate this, others contradict it.

That there is a relation between the damping effect and creep seems logical, since both are a measure of plasticity at very low stresses.

Fig. 3. The dump trucks go to the baling department and dump directly into the baling presses. Scrap which may be easily hung on the hooks of a trolley conveyor is carried in that way from the punch presses to the balers.

The finished automobile bodies are shipped to the various points of destination on long, specially designed transportation trucks. These draw up alongside the loading platform, where the bodies are loaded by an overhead crane with a three-point lifting device made up of steel channels and cables.

## Improved Handling Methods Speed Output of Auto Bodies

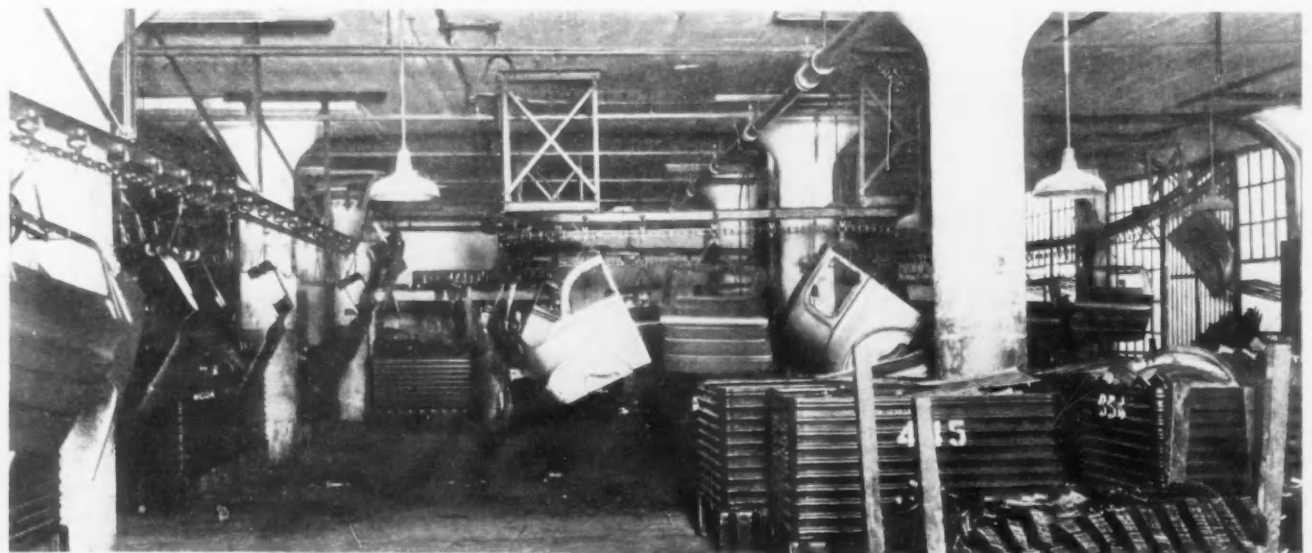
(Concluded from page 991)

vapor lights throughout the plant. The plant engineers have found that an abundance of good light is an economy and they have placed overhead lights at regular intervals to give uniform intensity at the working

level, and to reduce shadows as much as possible.

Scrap material is kept constantly moving from the punch presses to the baling presses. One method of transporting this material is shown in

"Tensile Properties of Cast Nickel-Chromium-Iron Alloys and of some Alloy Steels at Elevated Temperatures," is the title of Research Paper No. 474, published by the Bureau of Standards, Washington. The authors are William Kahlbaum and Louis Jordan.



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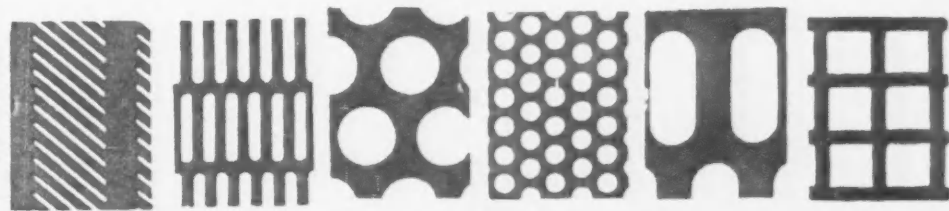
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## Restyling—a Major Factor in Future Merchandising Programs

(Concluded from page 988)

restyling is almost non-existent that restyling is gaining so much attention. Restyling will prove the strongest arm in merchandising programs of the future. It will be the salt that will whet the appetite of consumers and create the volume so essential to success. It will be the outlet for the creative urge that is inherent in all ages. It will affect all commodities, even those classed as purely of the producer type, because eye preference will decide purchases when other considerations are equal.

It may seem once more that what is apparently the longest way to

achieve an objective is the shortest way in the end. By satisfying the growing popular demand for beauty instead of mere utility, it will sustain business volume and yield the profits that come from mass output. By creating new lines and new forms it will incidentally uncover important technical and mechanical improvements. Just as a new product like the automobile creates new demands which stimulate advances in the design and performance of manufacturing equipment and the quality and service of materials, restyling will prove a constant stimulus to mechanical and technical ingenuity.

## New Instrument Makes Quantitative Analysis of Alloys Simple

THE "Recording Microphotometer" makes it possible for any company making metals and alloys to pour out of the furnace a small casting, take a microphotograph of it, and then determine its composition quantitatively and qualitatively without what is in the furnace. All this can be done in approximately one-half hour, much enough, in other words, to change the constituents of the alloy if it is found necessary.

The Spencer Recording Microphotometer, now offered by the Spencer Lens Co. of Buffalo is simple in operation, being practically automatic in action. The microphotograph of an alloy is made by the usual method and the plate then placed in the holder of the recording microphotometer. This plate moves through a beam of light. The source of light is an ordinary high-powered electric bulb which is focused by condensers on a slit which is projected onto the spectrum plate through a microscope objective. The image produced by the light on the plate is picked up by a microscope objective on the opposite of the plate, goes

through another slit and falls onto a photo-electric cell. This generates the photo-electric current, which is then amplified by a vacuum tube and then passes through a recording milliammeter which registers on the graph the variations.

This instrument is said to find a wide application in industrial plants, where it is necessary to make quantitative analyses of metals and alloys. Such analyses can be made quickly and easily by this method and, it is claimed, should result in a saving of many thousands of dollars in time to those companies who find it necessary to make such analyses by the ordinary routine method.

## Special Sensitive Plate for Metallographic Work

A photographic plate, designed especially for photomicrography of metal specimens is announced by the Eastman Kodak Co., Rochester, N. Y.

In addition to having properties which render it particularly suitable for metallography, it is designed to appeal to those photomicrographers who prefer not to use panchromatic plates, such as the Wratten "M" plate, which require handling in the dark.

The research laboratories of the Eastman company have recently produced a large number of new photographic sensitizing dyes, one of which is particularly satisfactory for sensitizing plates to be used in metallography. It is plates thus sensitized that are now being introduced under the name of Wratten metallographic plates. The characteristics of these plates which render them specially useful for metallography are:

High resolving power, permitting the best reproduction of fine detail; availability of a very high photographic contrast, for such subjects as steels at high magnifications; availability of lower contrast, yielding good negatives where there is high contrast in the image, as with steels at low magnifications; fast image; high green sensitivity as well as high sensitivity to blue light, which gives the plates maximum usefulness when used either with achromatic objectives and green filters or with apochromatic "Achromatic" and "Apochromatic" order of the types of lenses used for metallographic work. The "speed" of the plates under green light is unusually high in view of the high contrast obtainable. The speed under blue light has been achieved without sacrifice of the emulsion's resolving power, and absence of sensitivity to red light with the resulting freedom in further handling. The plates can be handled in the normal red light of a Wratten series 1 safelight.

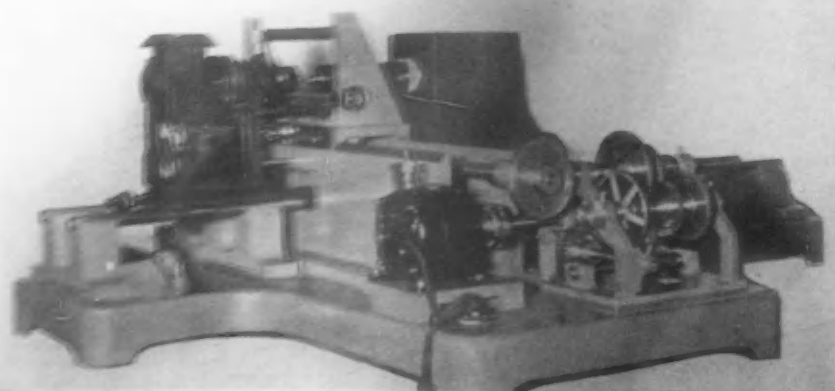
## Stainless Cold Steel Formed Into Tanks

(Concluded from Page 998)

steel welding rod at the mild steel surfaces.

The method of producing stainless clad steels allows the user or fabricator to specify any desired thickness of either surface, as the thickness of the stainless surface may be controlled in rolling to meet any specification. The stainless surface embodies the exact degree of corrosion resistance present in a solid stainless sheet of similar composition. The marked advantage of the stainless clad steel is one of price, as it is produced at approximately half the cost of solid stainless steel of similar gage.

Hausman & Wimmer Co., Clark Building, Pittsburgh, dealer in scrap iron and steel, is to be liquidated, and the Commonwealth Trust Co., Pittsburgh, has been named permanent equity receiver. The company's offices in New York and Detroit were closed recently. H. F. Stocker, formerly identified with the company, will conduct a scrap business in the former's quarters, the details of which will be announced later.



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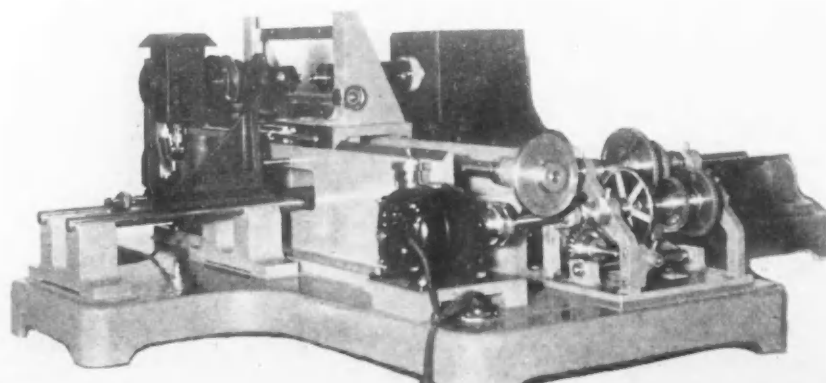
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